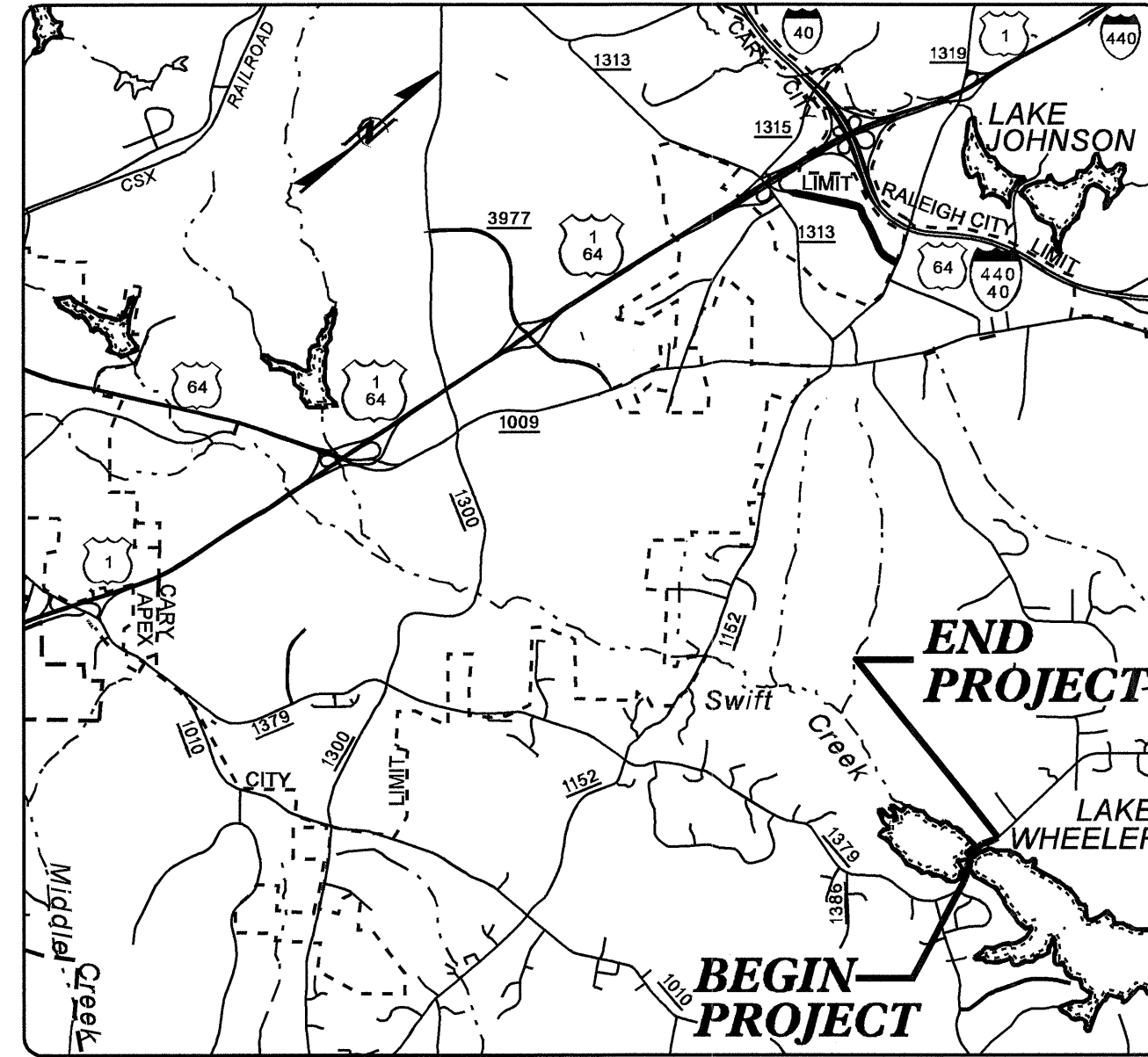


TIP PROJECT: B-3917

CONTRACT: C201619

STRUCTURE



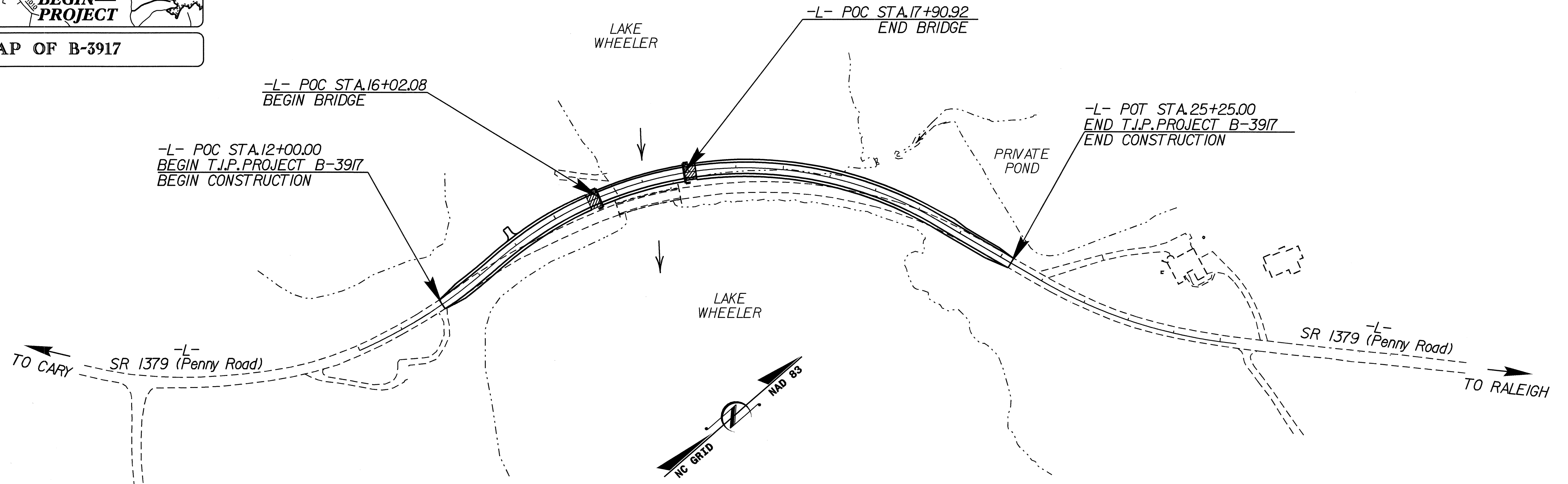
VICINITY MAP OF B-3917

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

**LOCATION: BRIDGE NO. 311 OVER LAKE WHEELER (SWIFT CREEK)  
ON SR 1379 (PENNY ROAD)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	
N.C.	B-3917	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33351.1.1	BRZ-1379(1)	PE
33351.2.1	BRZ-1379(1)	RW,UTIL
33351.3.1	BRZ-1379(3)	CONST



**DESIGN DATA**  
 ADT 2005 = 6,149  
 ADT 2024 = 13,800  
 DHV = 10%  
 D = 60%  
 T = 5%  
 TTST 2% DUAL 3%  
 V = 50 mph  
 FUNC CLASS = LOCAL  
 \* DESIGN EXCEPTIONS FOR STOPPING SIGHT DISTANCE AND VERTICAL CURVE LENGTH ARE REQUIRED

**PROJECT LENGTH**

LENGTH ROADWAY T.I.P. PROJECT B-3917	=	0.215 MILES
LENGTH STRUCTURES T.I.P. PROJECT B-3917	=	0.036 MILES
TOTAL LENGTH OF T.I.P. PROJECT B-3917	=	0.251 MILES

2006 STANDARDS SPECIFICATION

LETTING DATE:  
SEPTEMBER 18, 2007

Prepared In the Office of:  
**DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Drive Raleigh, N.C. 27610

\_\_\_\_\_  
**B. S. COX, P. E.**  
 PROJECT ENGINEER

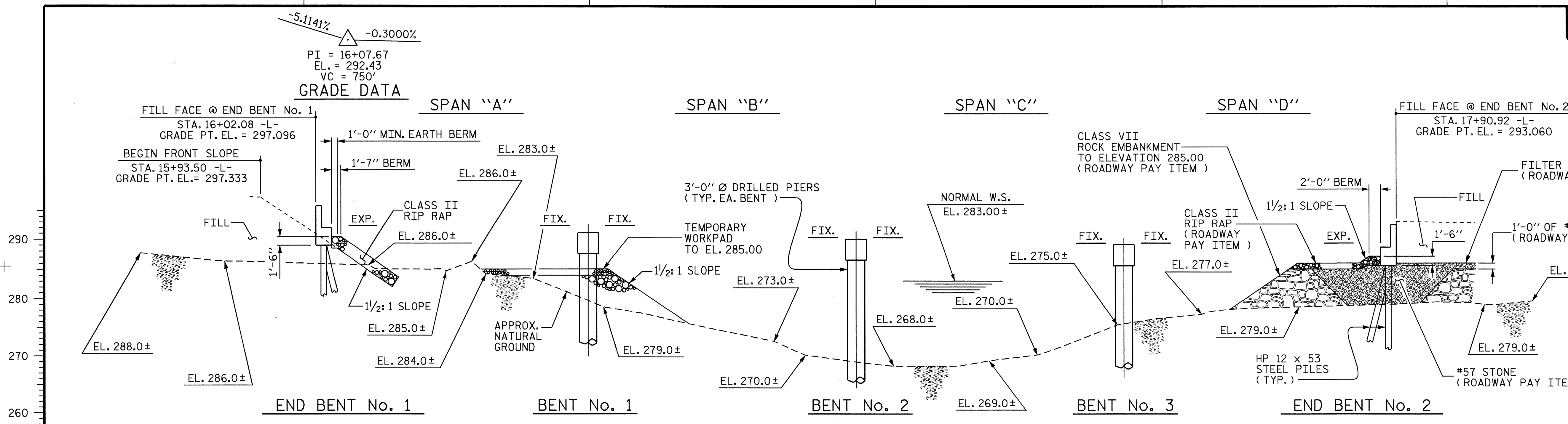
\_\_\_\_\_  
**T.J. BEACH, P. E.**  
 PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

\_\_\_\_\_  
 P.E.  
 STATE HIGHWAY ENGINEER - DESIGN  
 DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION

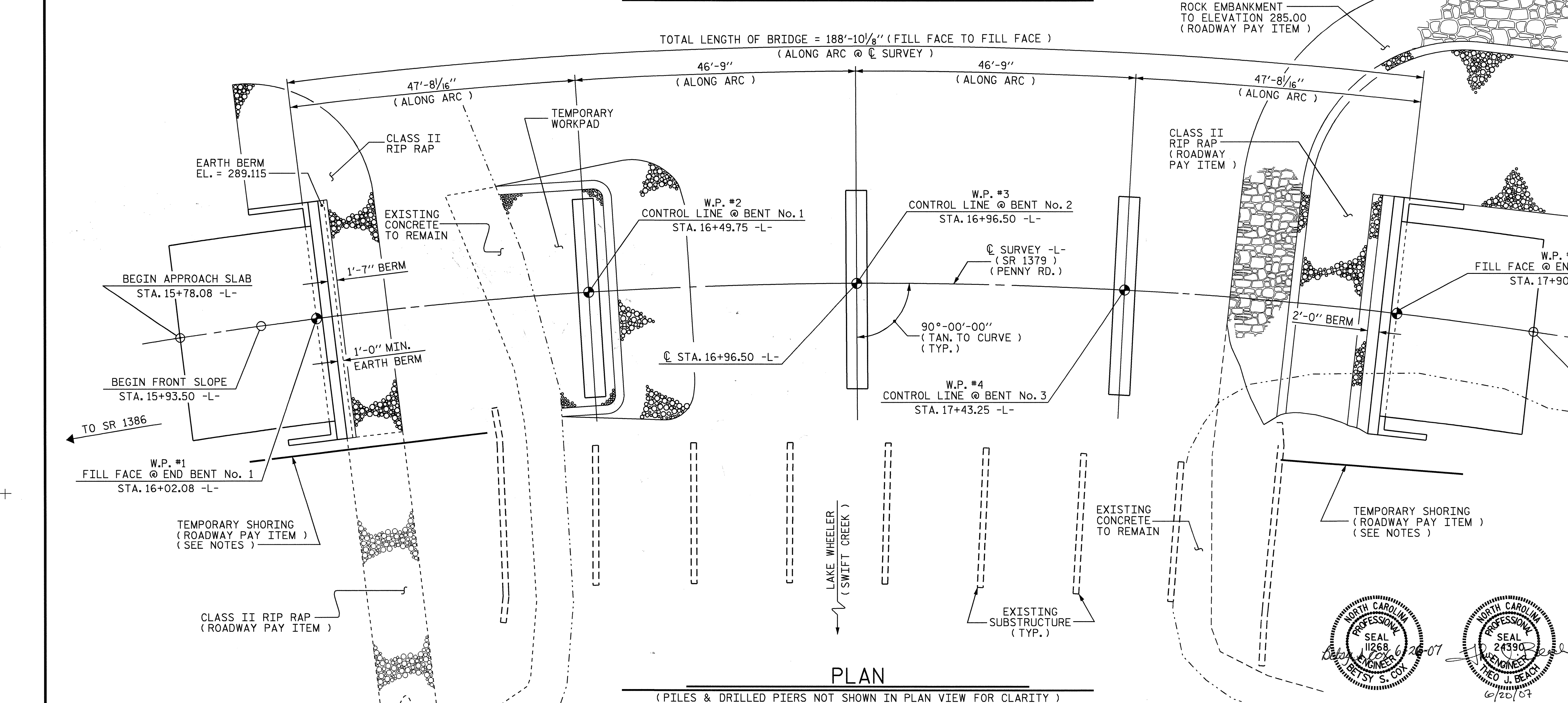
APPROVED FOR  
 DIVISION ADMINISTRATOR \_\_\_\_\_ DATE \_\_\_\_\_



**HORIZONTAL CURVE DATA**

PI STA.	= 19+19.22 -L-
Δ	= 71°-52'-28.8" (RT.)
D	= 7°-09'-43.1"
L	= 1003.56
T	= 579.90
R	= 800.00

**SECTION ALONG Q SURVEY -L-**



**PLAN**

(PILES & DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

PROJECT No. B-3917  
 WAKE COUNTY  
 STATION: 16+96.50 -L-

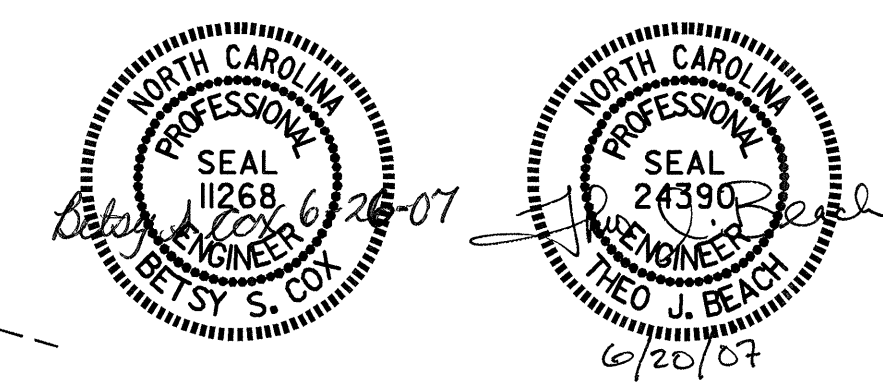
SHEET 1 OF 4 REPLACES BRIDGE #311

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

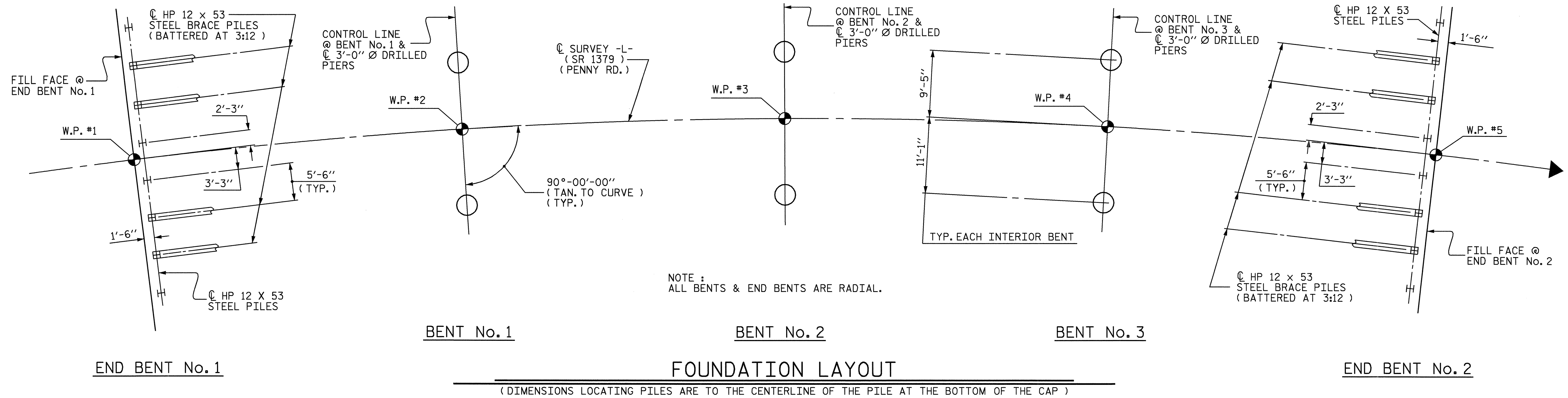
**GENERAL DRAWING**  
 BRIDGE ON RELOCATED  
 SR 1379 (PENNY RD.) OVER  
 LAKE WHEELER (SWIFT CREEK)  
 BETWEEN SR 1386 AND SR 1375

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			36

DRAWN BY: MIKE BRITT DATE: 2-14-07  
 CHECKED BY: THEO BEACH DATE: 2/07







**NOTES :**

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT PRESTRESSED CONCRETE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR ROCK EMBANKMENT AND CORE MATERIAL IN AREA OF END BENT No. 2, SEE ROADWAY PLANS.

WORK ON END BENT No. 2 SHALL NOT BE STARTED UNTIL APPROACH ROCK EMBANKMENT AND CORE MATERIAL IN THE AREA OF THE END BENT PILES HAS BEEN PLACED.

THE EXISTING STRUCTURE CONSISTING OF REINFORCED CONCRETE WITH ASPHALT WEARING SURFACE FLOOR ON TIMBER JOISTS WITH SPANS OF 1 @ 17'-0", 1 @ 16'-9", 1 @ 16'-8", 2 @ 16'-9", 2 @ 16'-8" & 1 @ 17'-6" WITH A CLEAR ROADWAY WIDTH OF 24'-0" ON TIMBER CAPS WITH TIMBER PILES AND CONCRETE MUDSILLS SUBSTRUCTURE AND LOCATED ADJACENT TO THE PROPOSED STRUCTURE ON THE DOWNSTREAM SIDE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS. THE PILE BENTS SHALL BE EXTRACTED. HOWEVER, IF COMPLETE EXTRACTION IS NOT POSSIBLE, THEN THE PILES AT BENTS 1 AND 7 WILL BE CUT AT LAKE BED LEVELS AND THE PILES AT BENTS 2 THROUGH 6 WILL BE CUT AT THE TOP OF THE MUDSILL OR AT THE TOP OF THE LAKE BED LEVEL AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL USE CAUTION DURING PILE EXTRACTION TO AVOID DAMAGING THE EXISTING CONCRETE SLOPE PROTECTION.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR TEMPORARY SHORING PAY ITEM, SEE ROADWAY PLANS.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE WORKPAD, THE CLASS II RIP RAP USED IN THE WORKPAD MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 16+96.50 -L-.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

DRILLED PIERS AT BENT No. 1, BENT No. 2 AND BENT No. 3 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 60 TSF.

DRILLED PIERS AT BENT No. 1, BENT No. 2 AND BENT No. 3 ARE DESIGNED FOR AN APPLIED LOAD OF 210 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIER AT BENT No. 1, PIER #1. DO NOT EXTEND THE CASING BELOW ELEVATION 273 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. SEE DRILLED PIERS SPECIAL PROVISION.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIER AT BENT No. 1, PIER #2. DO NOT EXTEND THE CASING BELOW ELEVATION 275 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. SEE DRILLED PIERS SPECIAL PROVISION.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT No. 2 AND BENT No. 3. DO NOT EXTEND THE CASING BELOW ELEVATION 266 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. SEE DRILLED PIERS SPECIAL PROVISION.

DRILLED PIER AT BENT No. 1, PIER #1 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 267 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIER AT BENT No. 1, PIER #2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 269 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT No. 2 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 260 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

DRILLED PIERS AT BENT No. 3 SHALL EXTEND TO AN ELEVATION NO HIGHER THAN 260 FT. AND SATISFY THE REQUIRED END BEARING CAPACITY.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 IS ELEVATION 274 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 2 AND BENT No. 3 IS ELEVATION 265 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISION.

SPT TESTING IS NOT REQUIRED TO DETERMINE THE END BEARING CAPACITY OF THE DRILLED PIERS AT BENT No. 1, BENT No. 2 AND BENT No. 3.

SID INSPECTIONS MAY BE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. SEE DRILLED PIERS SPECIAL PROVISION.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

DRIVE PILES AT END BENT No. 1 AND END BENT No. 2 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT END BENT No. 1 FOR PILES NUMBER 4 THROUGH 8. SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No. 1 AND END BENT No. 2 IS 50 TONS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT No. 1 FOR PILES NUMBER 1 THROUGH 3. EXCAVATE HOLES TO ELEVATION 280 FT. SEE PILE EXCAVATION SPECIAL PROVISION.

CONTRACTOR SHALL POST NOTICES AT THE LAKE WHEELER BOAT DOCKS THAT ACCESS UNDER AND ADJACENT TO THIS BRIDGE IS RESTRICTED DURING PROJECT CONSTRUCTION. CONTRACTOR SHALL COORDINATE WORDING AND POSTING LOCATIONS WITH THE ENGINEER.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT No. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

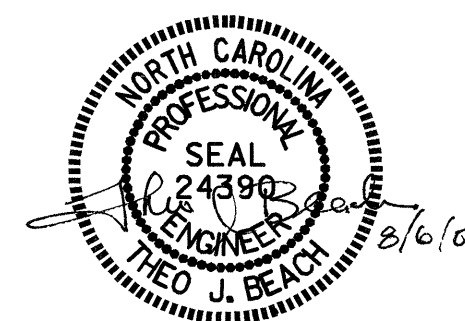
SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

BRIDGE ON RELOCATED  
 SR 1379 (PENNY RD.) OVER  
 LAKE WHEELER (SWIFT CREEK )  
 BETWEEN SR 1386 AND SR 1375

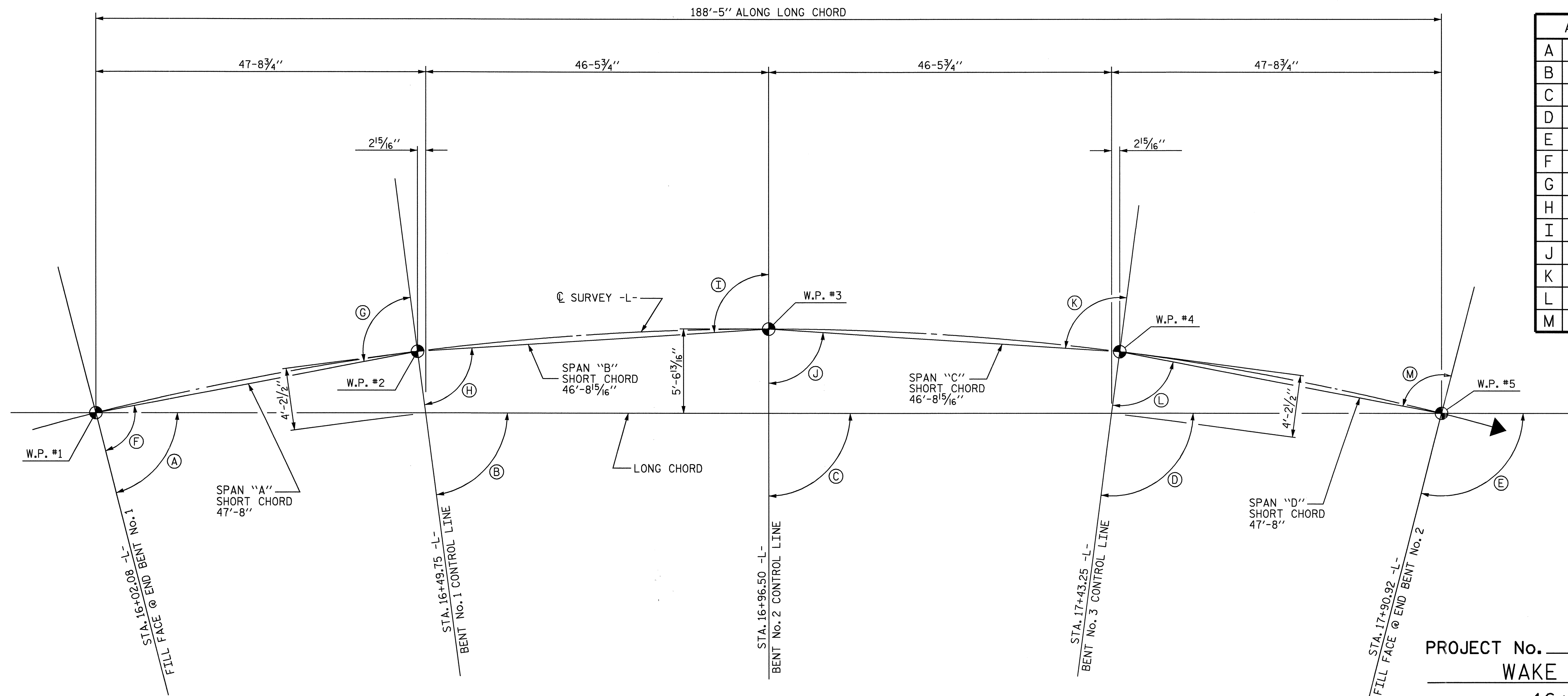
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			36



DRAWN BY : MIKE BRITT DATE : 2-16-07  
 CHECKED BY : THEO BEACH DATE : 2/07

HORIZONTAL CURVE DATA

PI STA. = 19+19.22 -L-  
 $\Delta = 71^\circ-52'-28.8''$  (RT.)  
 $D = 7^\circ-09'-43.1''$   
 $L = 1003.56$   
 $T = 579.90$   
 $R = 800.00$



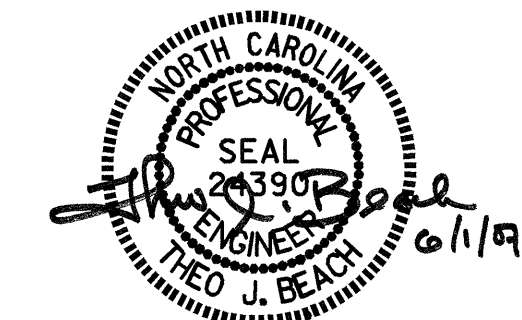
ANGLES	
A	83°-14'-15"
B	86°-39'-06"
C	90°-00'-00"
D	93°-20'-54"
E	96°-45'-45"
F	88°-17'-34"
G	91°-42'-26"
H	88°-19'-33"
I	91°-40'-27"
J	88°-19'-33"
K	91°-40'-27"
L	88°-17'-34"
M	91°-42'-26"

LONG CHORD LAYOUT

ALL BENTS & END BENTS ARE RADIAL TO  $\text{CL SURVEY -L-}$

PROJECT No. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE ON RELOCATED  
 SR 1379 (PENNY RD.) OVER  
 LAKE WHEELER (SWIFT CREEK )  
 BETWEEN SR 1386 AND SR 1375

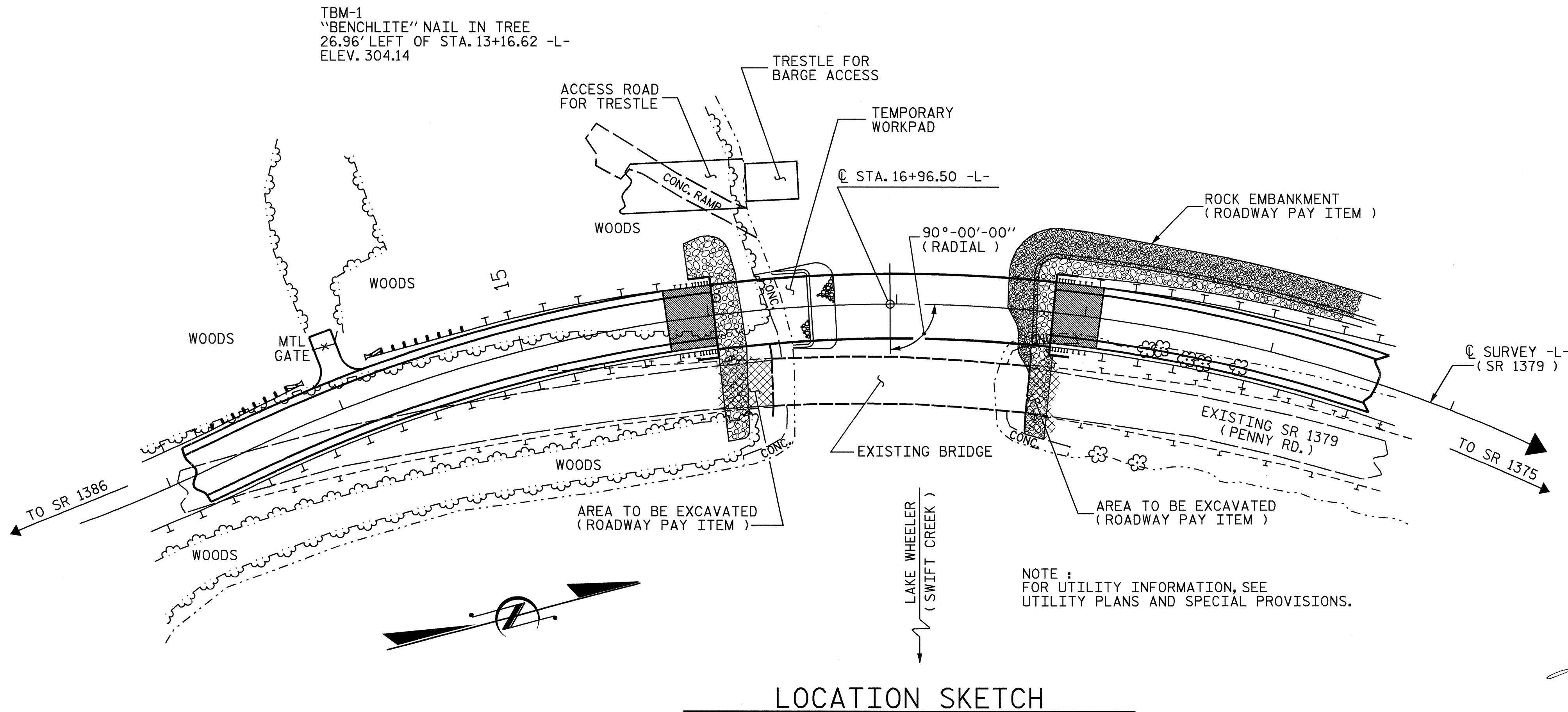
DRAWN BY : MIKE BRITT DATE : 2-20-07  
 CHECKED BY : THEO BEACH DATE : 2/07

REVISIONS						SHEET No.
No.	By:	DATE:	No.	By:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			36



**TOTAL BILL OF MATERIAL**

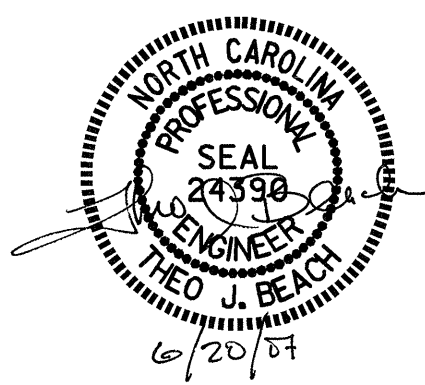
	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTION	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET (2'-0" THICK)	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS		
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	No.	LIN. FT.	No.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										6,824	7,221		LUMP SUM			20	917.26		357.89	373.06				LUMP SUM	LUMP SUM	
END BENT No. 1			14.0	16.0								23.0		3,629			8	80.0	5				112	124		
BENT No. 1					25.2	14.0	27.1					18.9		5,113	741											
BENT No. 2					39.0	14.0	41.0					18.9		5,677	988											
BENT No. 3					37.2	14.0	39.1					18.9		5,602	959											
END BENT No. 2												22.9		3,617			8	160.0								
TOTAL	LUMP SUM	LUMP SUM	14.0	16.0	101.4	42.0	107.2	1	1	6,824	7,221	102.6	LUMP SUM	23,638	2,688	20	917.26	16	240.0	5	357.89	373.06	112	124	LUMP SUM	LUMP SUM



**HYDROGRAPHIC DATA**  
 DESIGN DISCHARGE----- 6300 CFS  
 FREQUENCY OF DESIGN FLOOD----- 50 YR.  
 DESIGN HIGH WATER ELEVATION----- 290.70  
 DRAINAGE AREA----- 25.6 SQ.MI.  
 BASIC DISCHARGE (Q100)----- 7950 CFS  
 BASIC HIGH WATER ELEVATION----- 291.70  
  
 OVERTOPPING FLOOD DATA  
 OVERTOPPING DISCHARGE----- 6300- CFS  
 FREQUENCY OF OVERTOPPING FLOOD- 50- YRS  
 OVERTOPPING FLOOD ELEVATION---- 290.50

PROJECT No. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 4 OF 4  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON RELOCATED  
 SR 1379 (PENNY RD.) OVER  
 LAKE WHEELER (SWIFT CREEK )  
 BETWEEN SR 1386 AND SR 1375



NOTE :  
 FOR UTILITY INFORMATION, SEE  
 UTILITY PLANS AND SPECIAL PROVISIONS.

DRAWN BY : MIKE BRITT DATE : 2-14-07  
 CHECKED BY : THEO BEACH DATE : 2/07

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-4
1			3			TOTAL SHEETS 36
2			4			

**NOTES:**

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

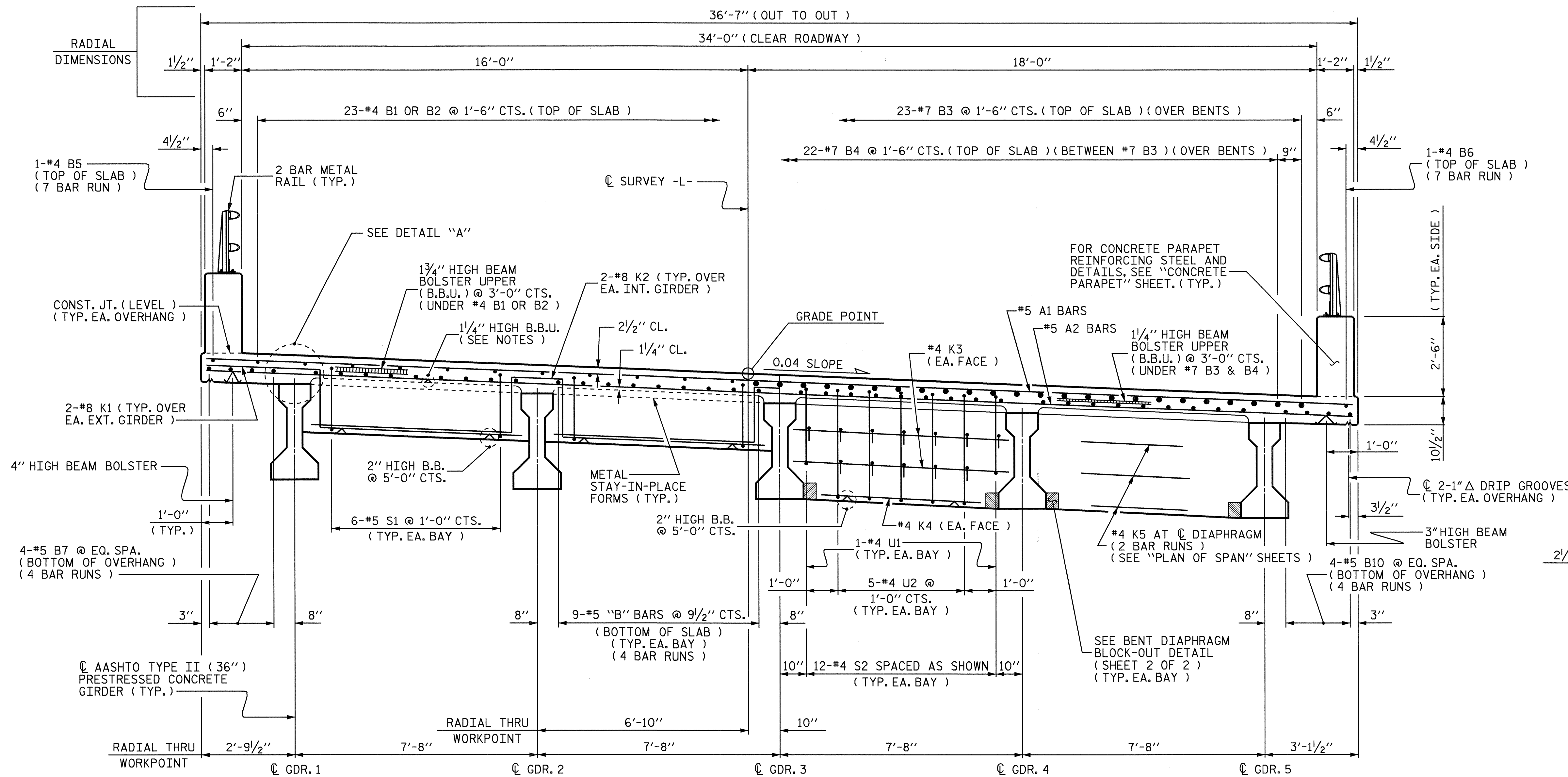
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND THE END POSTS.



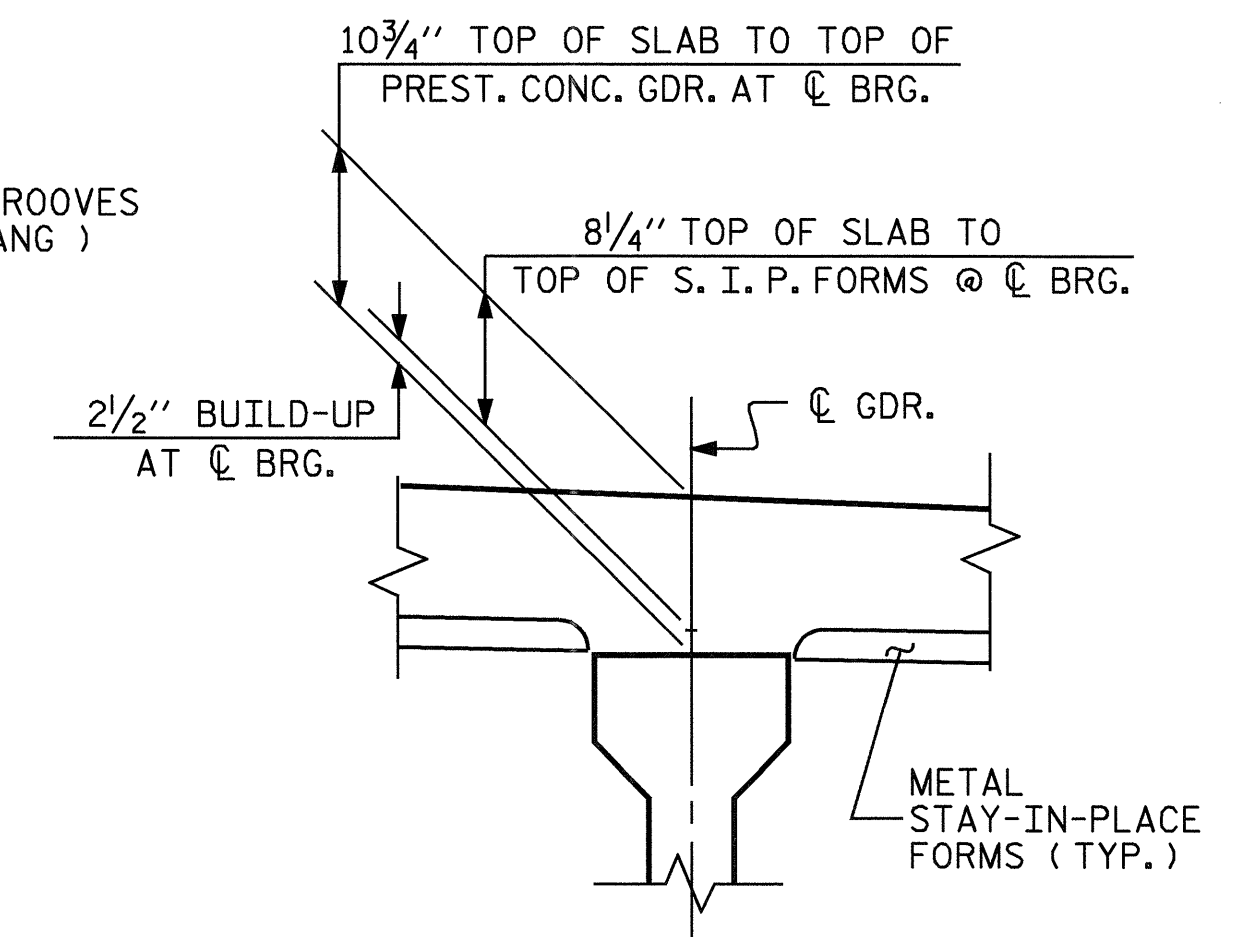
**HALF TYPICAL SECTION**

(SHOWING END BENT DIAPHRAGMS)

**HALF TYPICAL SECTION**

(SHOWING CONTINUOUS FOR LIVE LOAD DIAPHRAGMS)

NOTE:  
FOR INTERMEDIATE DIAPHRAGMS,  
SEE "STANDARD INTERMEDIATE  
DIAPHRAGMS" SHEET



**DETAIL "A"**

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

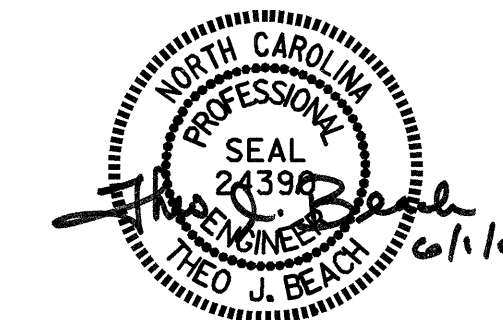
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			36

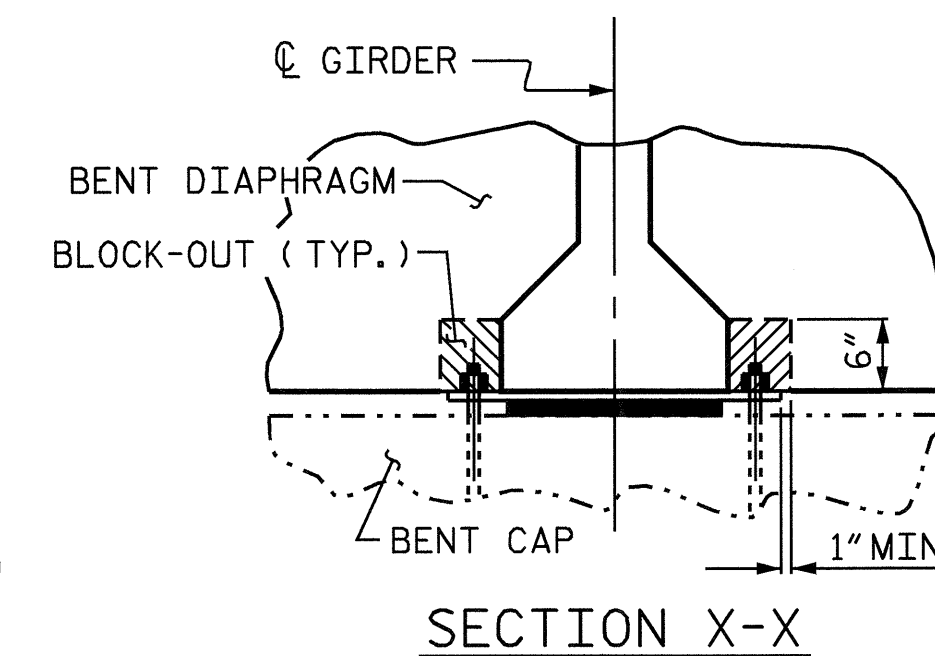
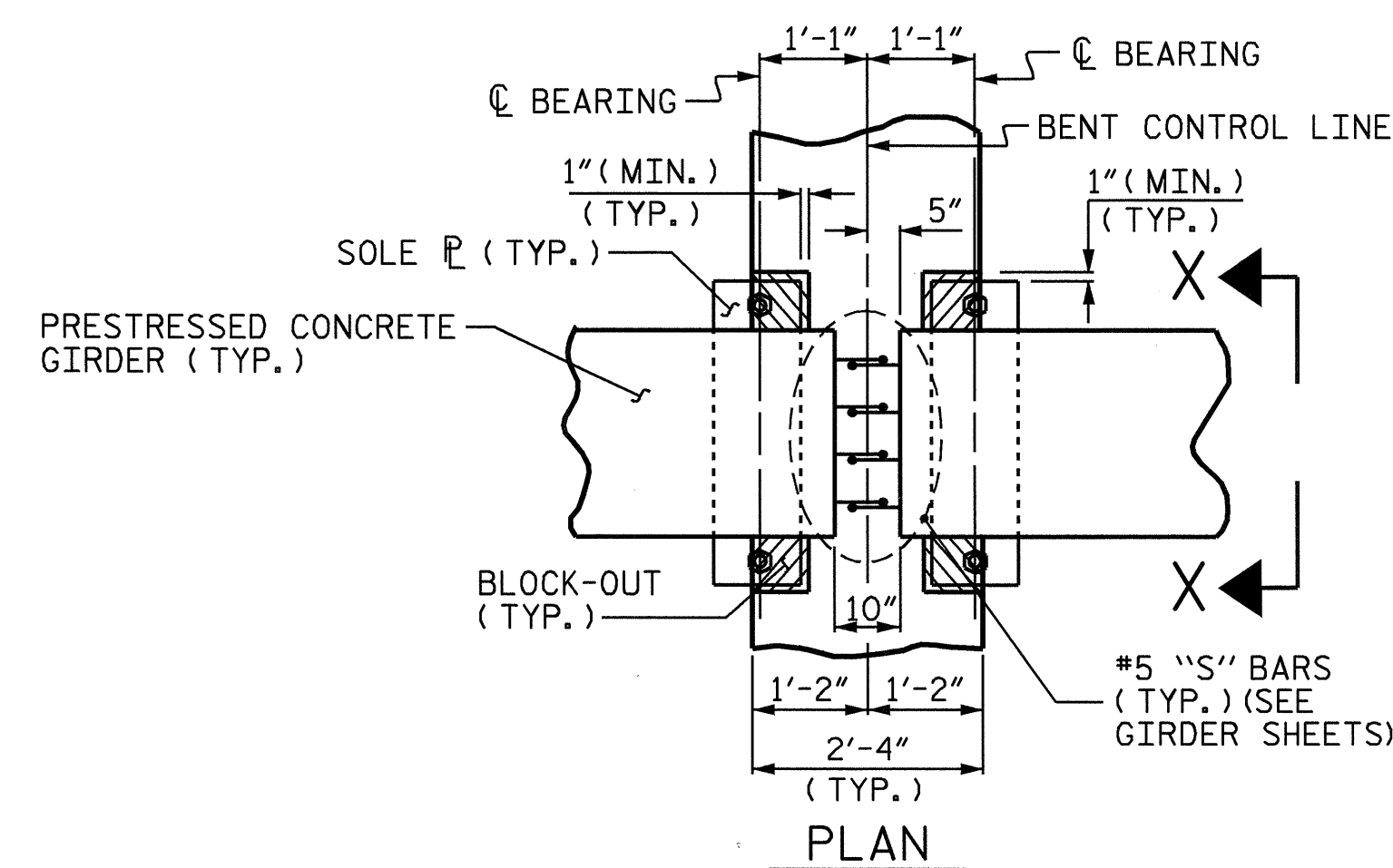
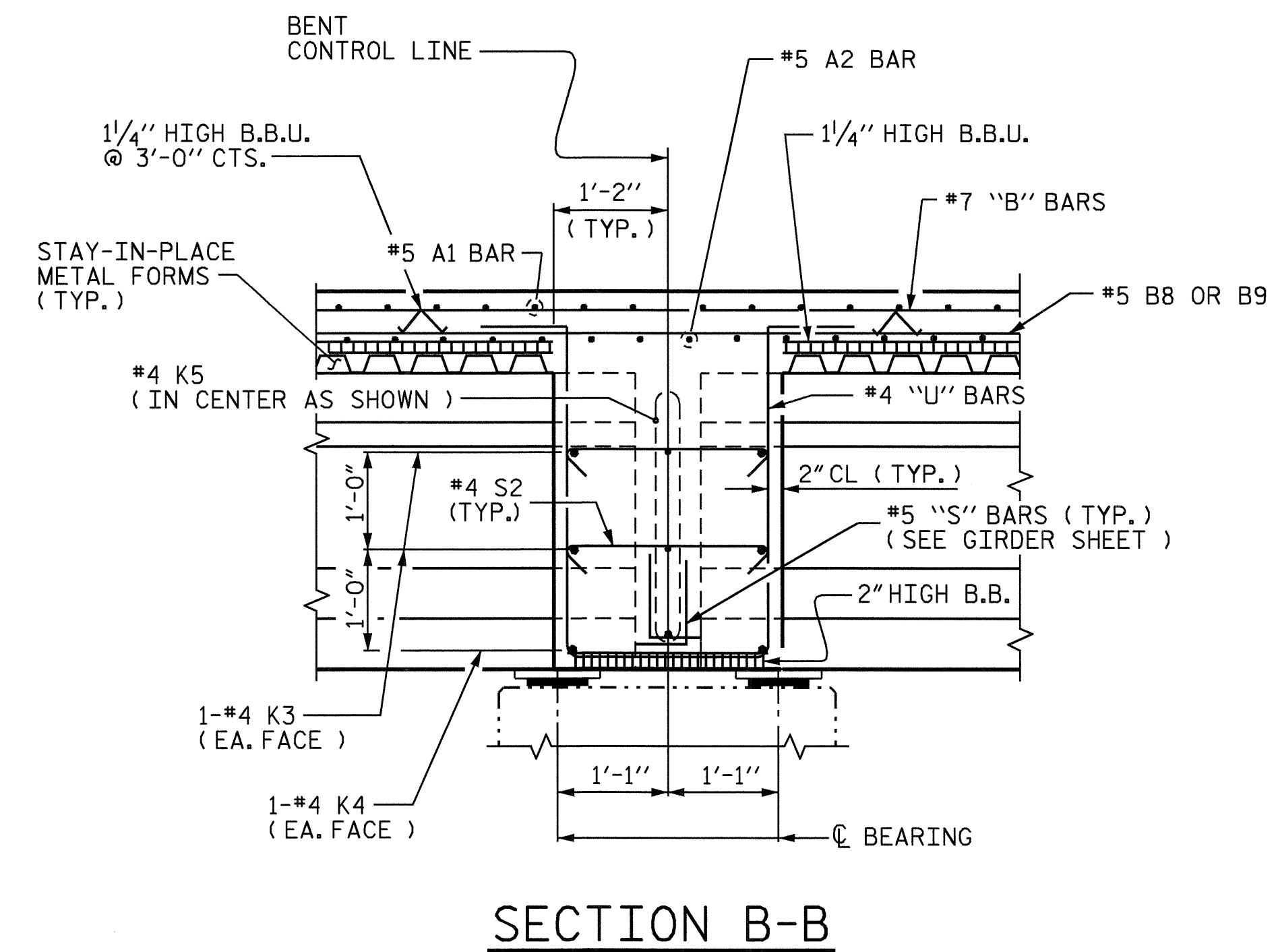
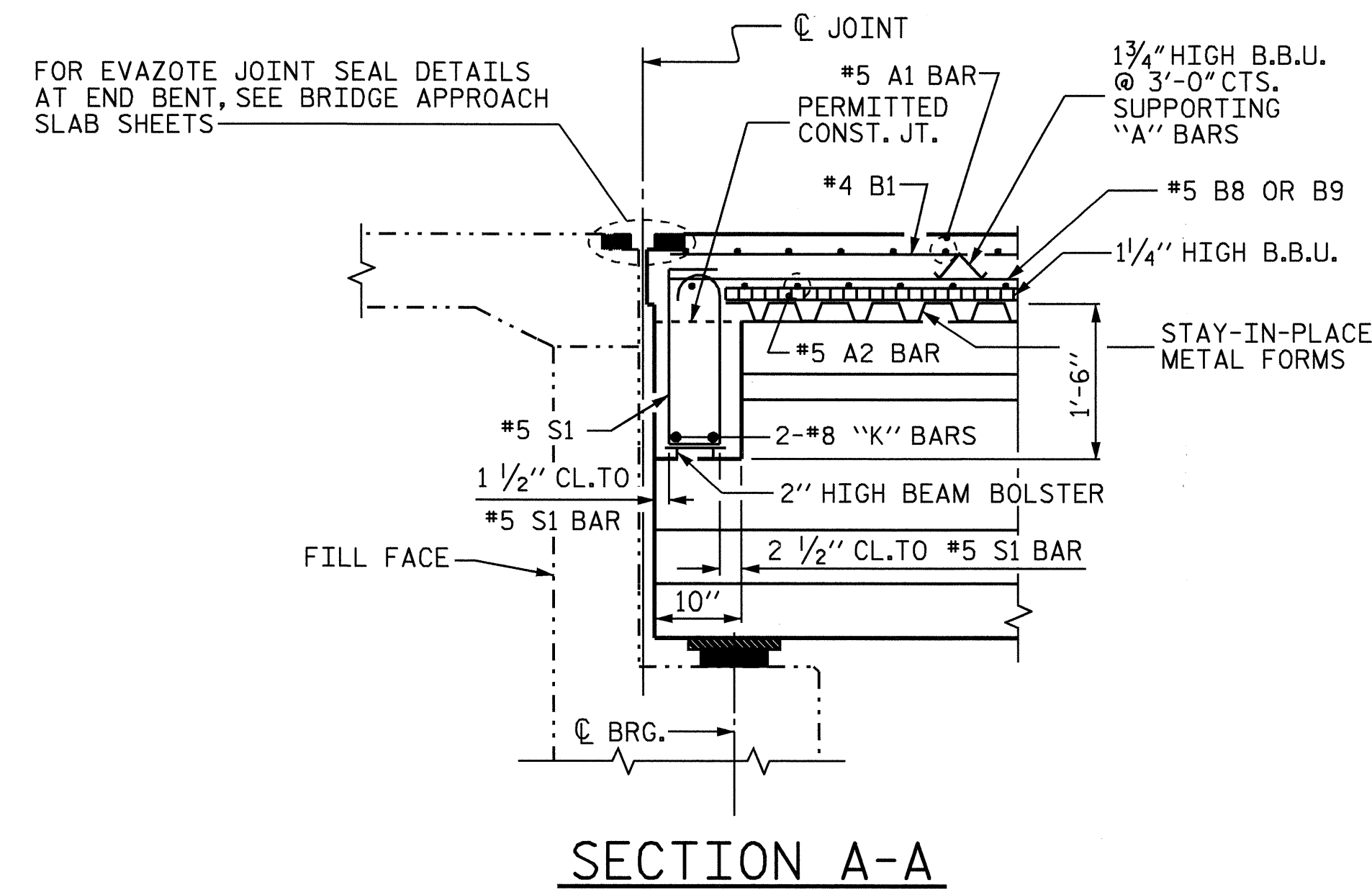
DRAWN BY: MIKE BRITT DATE: 1-4-06  
 CHECKED BY: A.K. PATEL DATE: 2-27-06





**NOTES:**

FOR LOCATION OF SECTIONS, SEE "PLAN OF SPAN" SHEETS.



**BENT DIAPHRAGM BLOCK-OUT DETAIL**

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

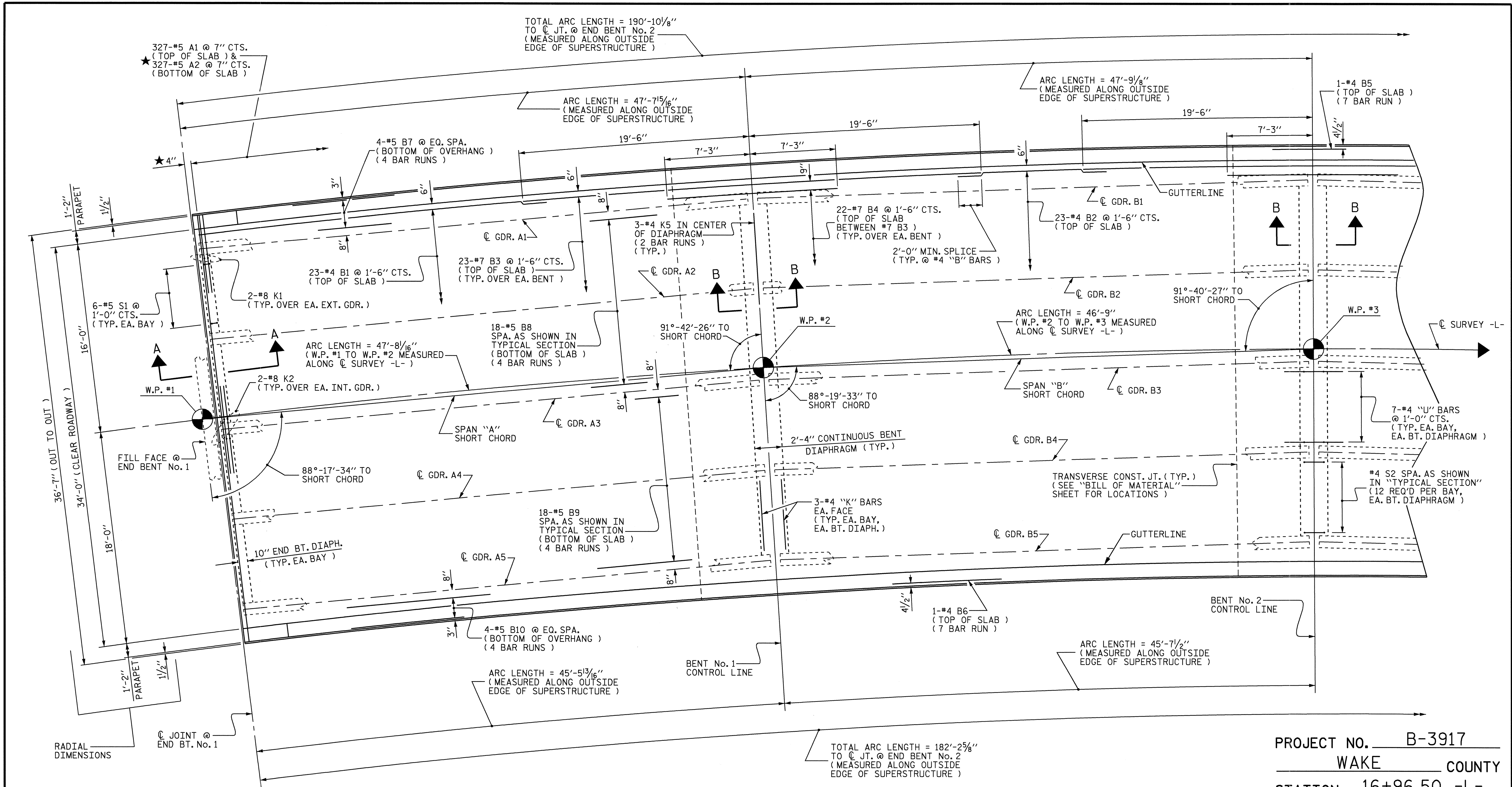
SUPERSTRUCTURE  
 TYPICAL SECTION



DRAWN BY: MIKE BRITT DATE: 1-4-06  
 CHECKED BY: A.K. PATEL DATE: 2-27-06

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S-6
TOTAL SHEETS
36



PLAN OF SPANS "A" & "B"

NOTES :

\*#5 "A" BARS ARE TO BE PLACED RADIALLY @ 7" CENTERS MEASURED ALONG LEFT OUTSIDE EDGE OF SUPERSTRUCTURE AND TAPERED TO 6 1/16" CENTERS ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 2 OF 2.

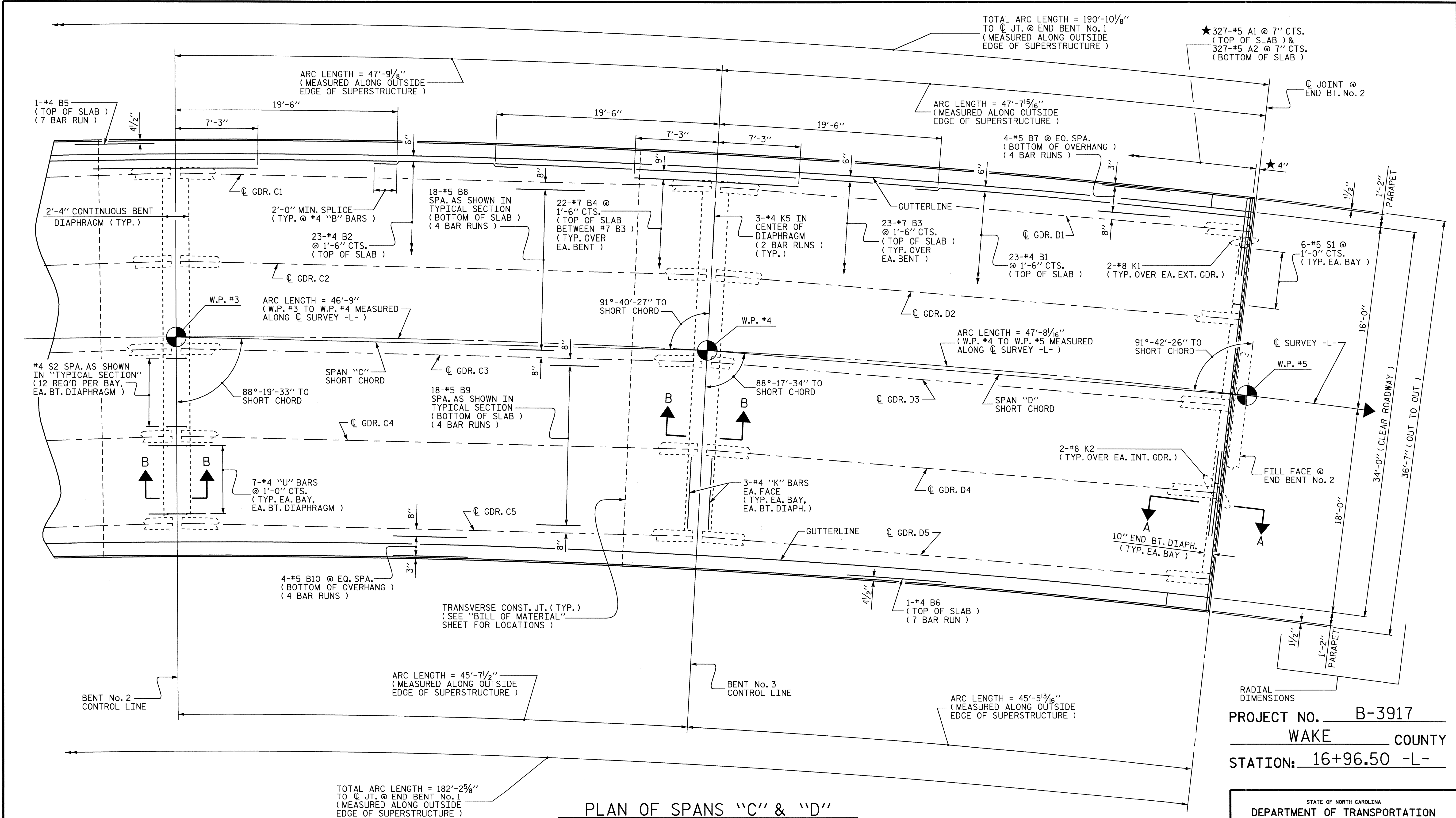


PROJECT NO. B-3917  
 WAKE COUNTY  
 STATION: 16+96.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS "A" & "B"					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					36

DRAWN BY : MIKE BRITT DATE : 1-26-06  
 CHECKED BY : A.K. PATEL DATE : 3-1-06





**PLAN OF SPANS "C" & "D"**

**NOTES :**

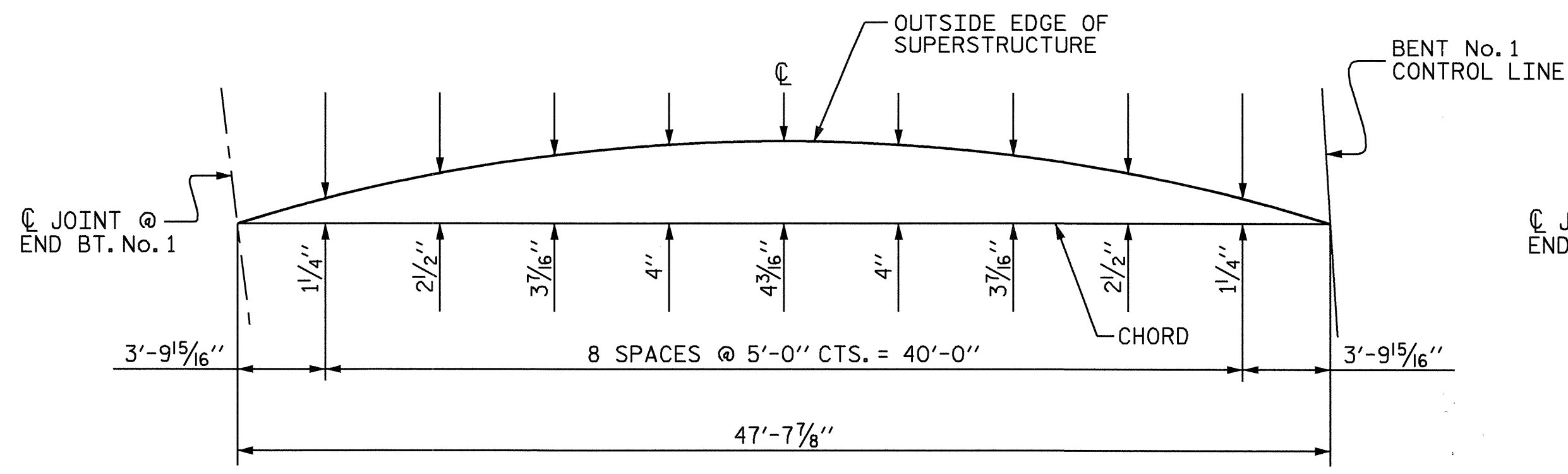
- #5 "A" BARS ARE TO BE PLACED RADIALLY @ 7" CENTERS MEASURED ALONG LEFT OUTSIDE EDGE OF SUPERSTRUCTURE AND TAPERED TO 6 1/16" CENTERS ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.
- FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.
- FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 2 OF 2.



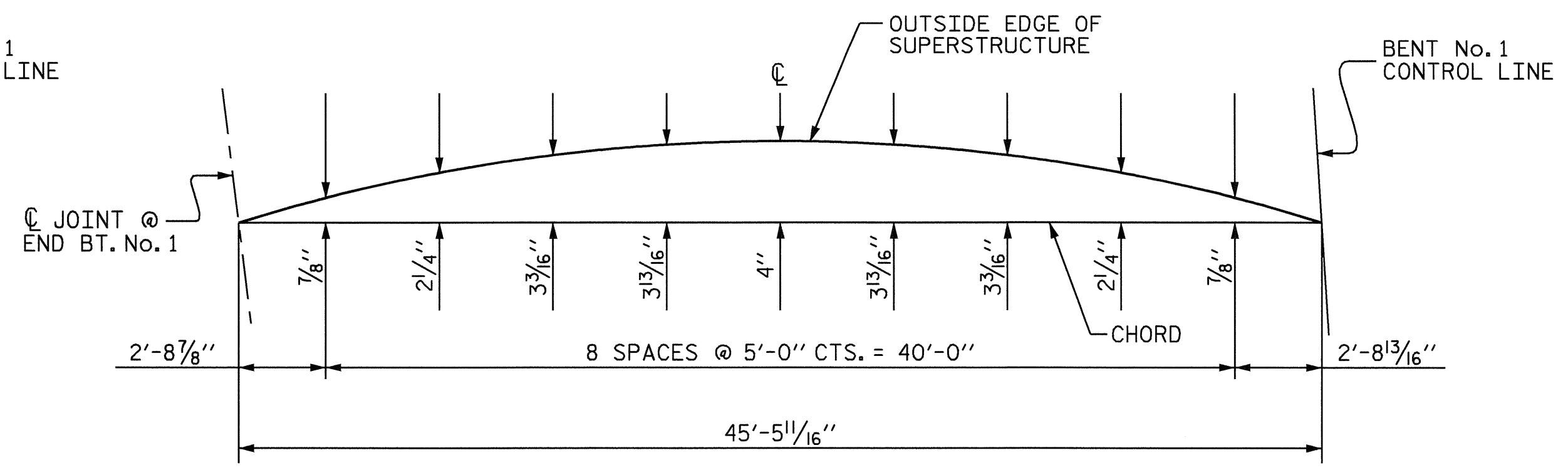
PROJECT NO. **B-3917**  
 WAKE COUNTY  
 STATION: **16+96.50 -L-**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS "C" & "D"					
SHEET NO. S-8					
TOTAL SHEETS 36					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

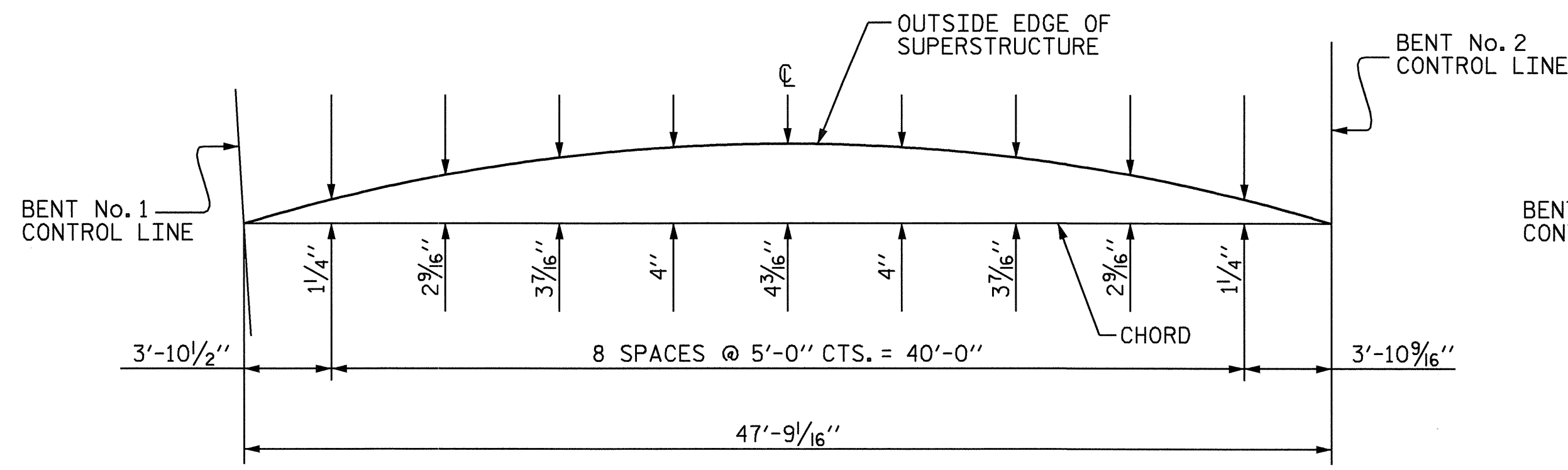
DRAWN BY: MIKE BRITT DATE: 1-31-06  
 CHECKED BY: A.K. PATEL DATE: 3-1-06



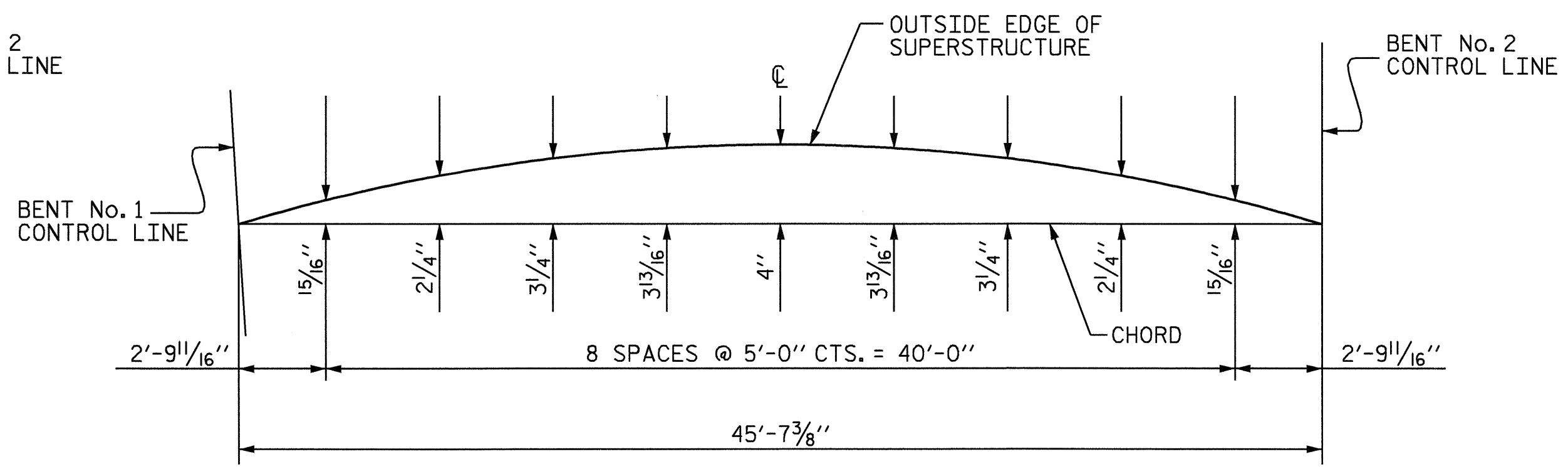
LEFT SIDE - SPAN "A"



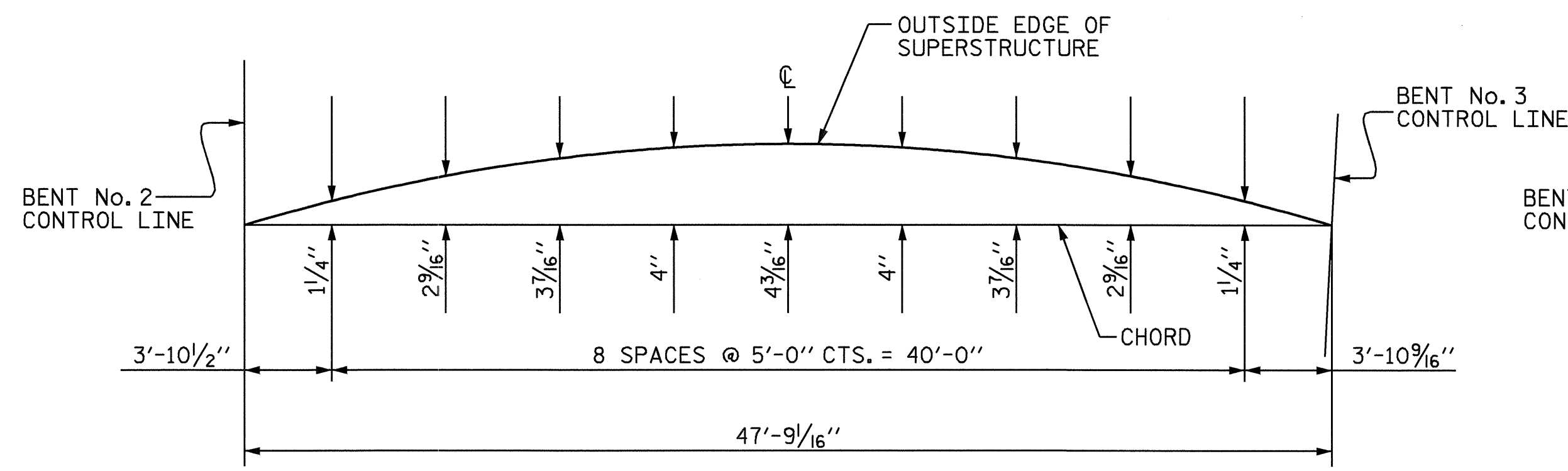
RIGHT SIDE - SPAN "A"



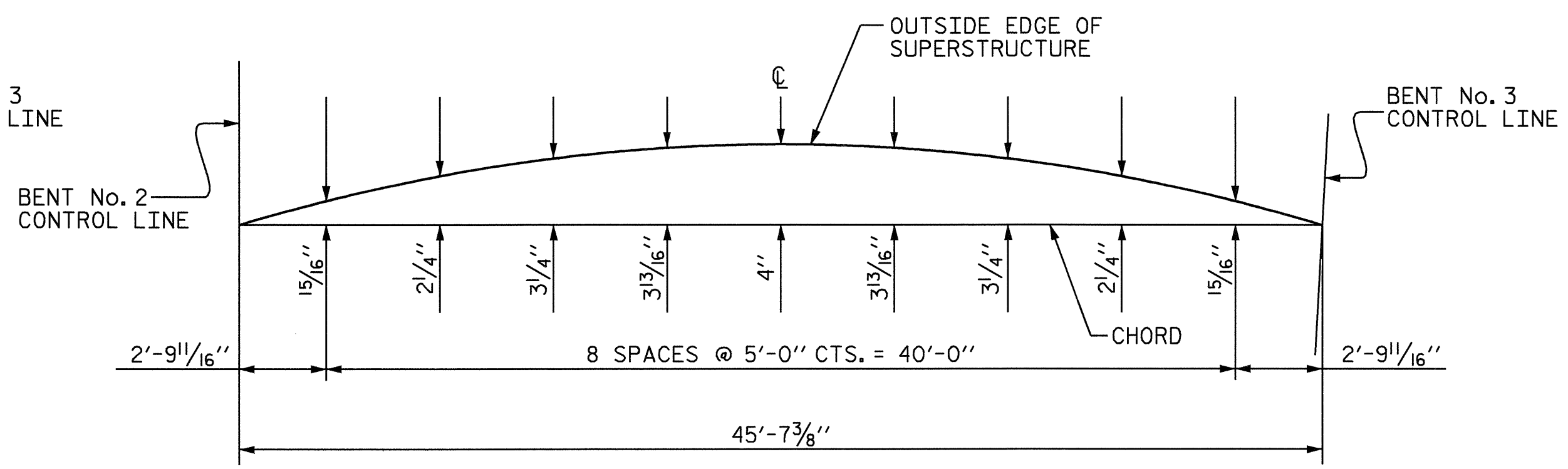
LEFT SIDE - SPAN "B"



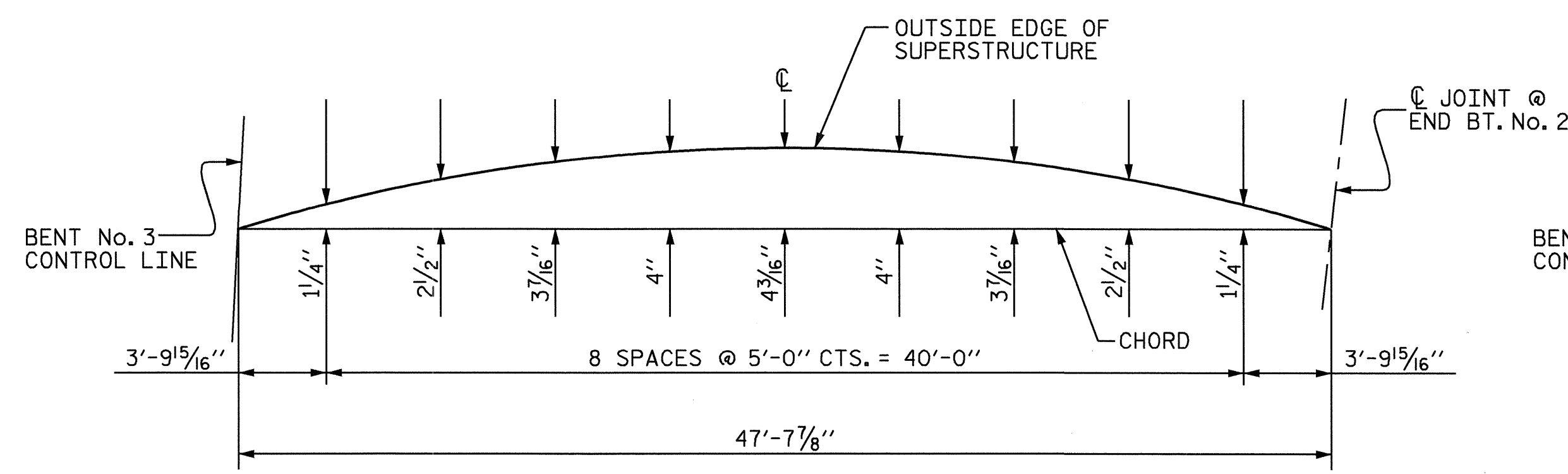
RIGHT SIDE - SPAN "B"



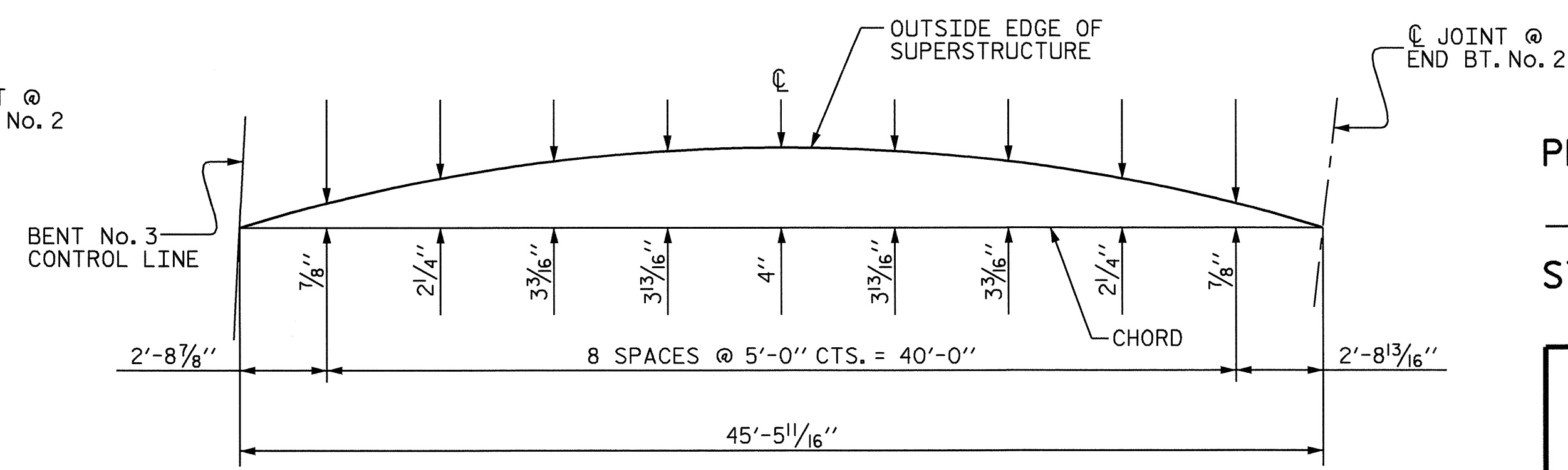
LEFT SIDE - SPAN "C"



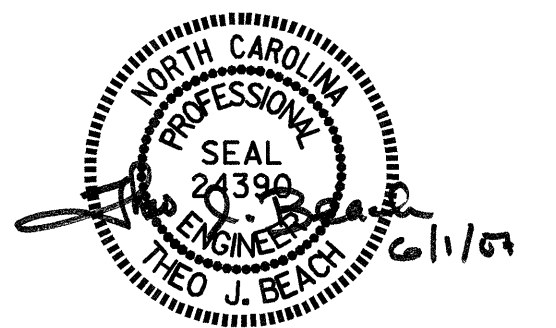
RIGHT SIDE - SPAN "C"



LEFT SIDE - SPAN "D"



RIGHT SIDE - SPAN "D"

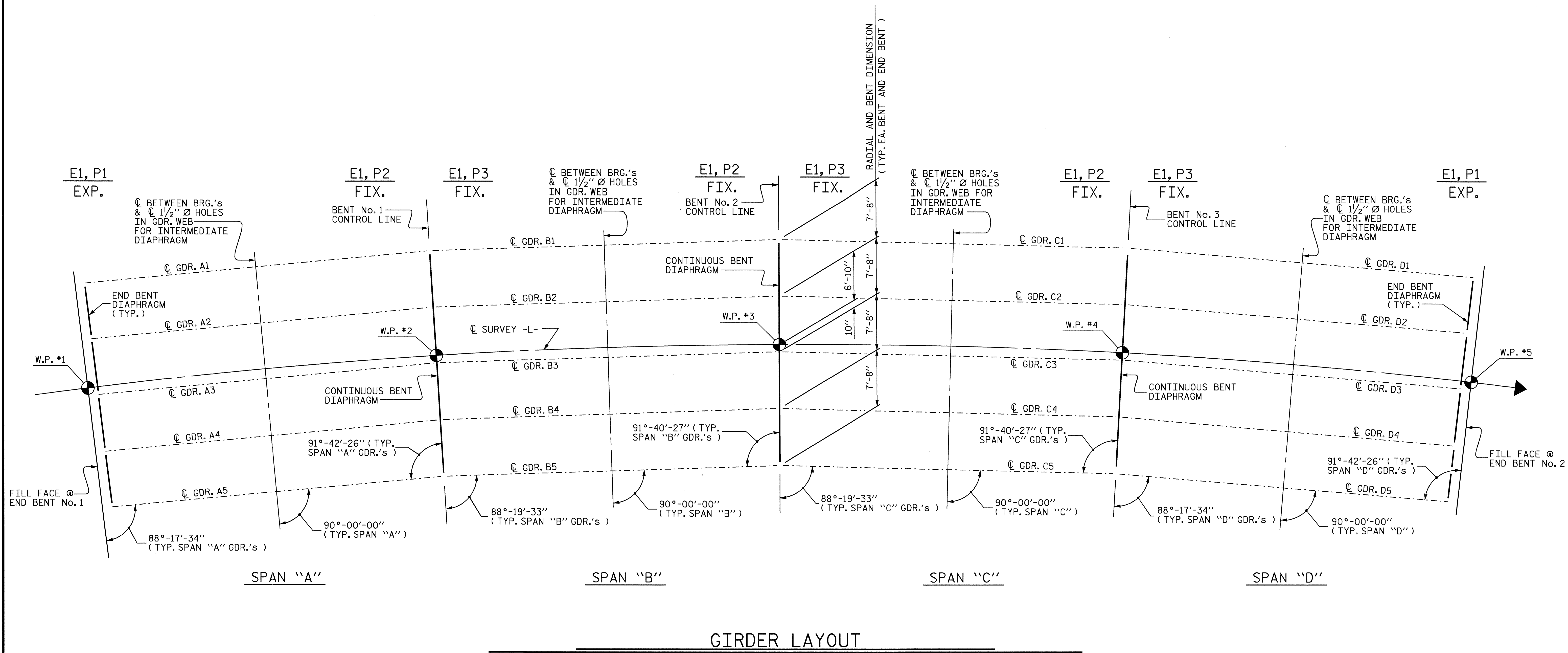


PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-9
SUPERSTRUCTURE ARC OFFSETS						
REVISIONS						TOTAL SHEETS 36
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: MIKE BRITT DATE: 2-1-06  
 CHECKED BY: A.K. PATEL DATE: 2-28-06





**GIRDER LAYOUT**

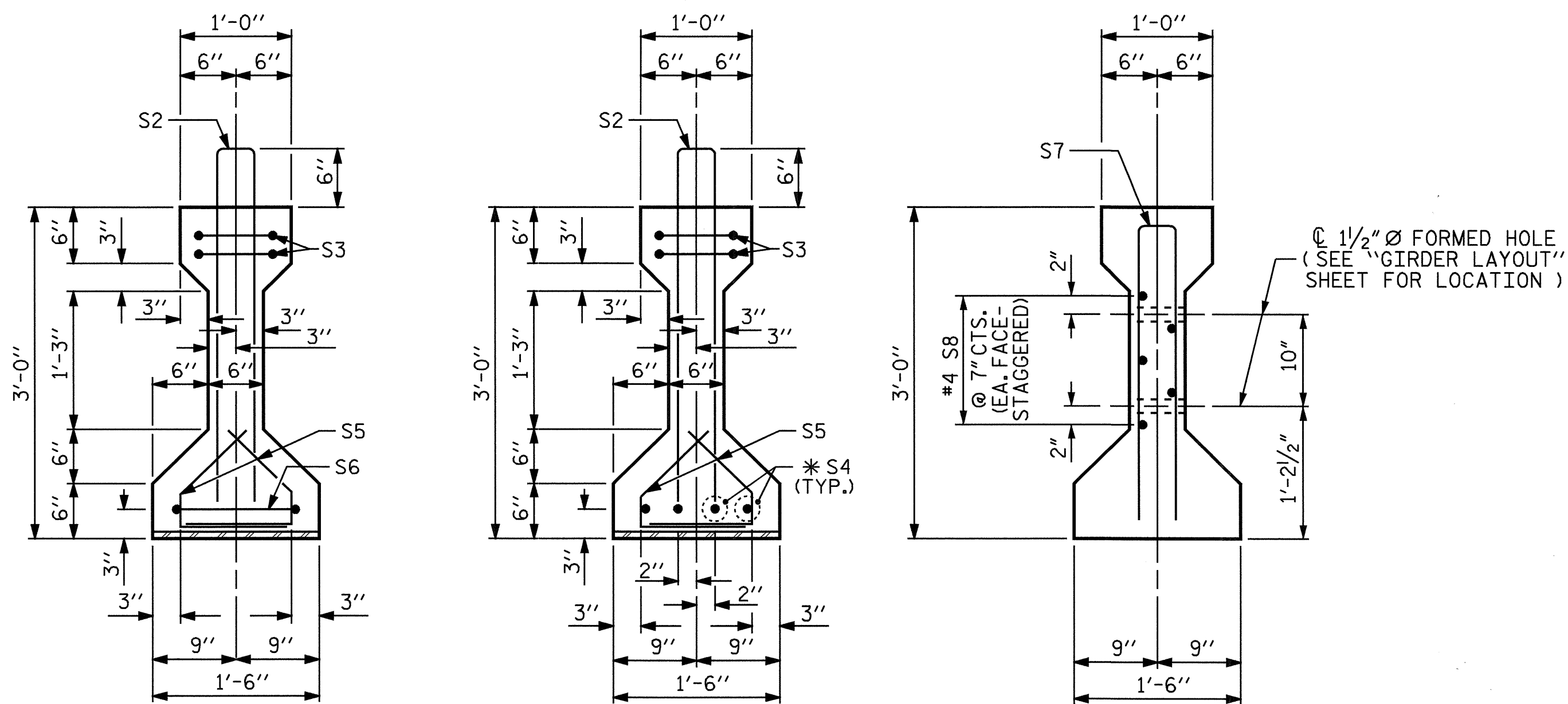
PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER LAYOUT

DRAWN BY : MIKE BRITT DATE : 1-11-06  
 CHECKED BY : A.K. PATEL DATE : 3-7-06

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	
2			4			36	

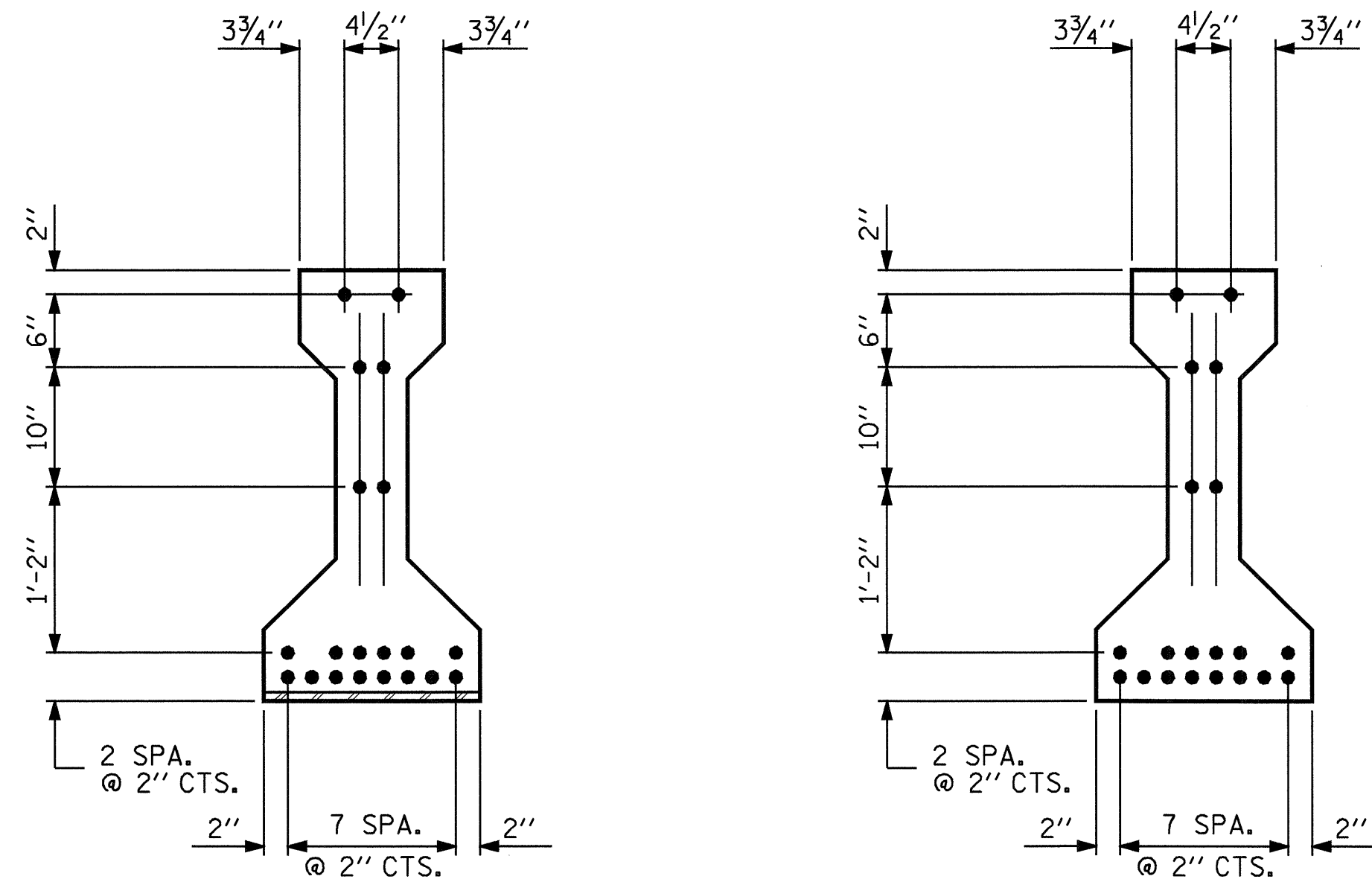


SECTION A-A

SECTION B-B

SECTION C-C

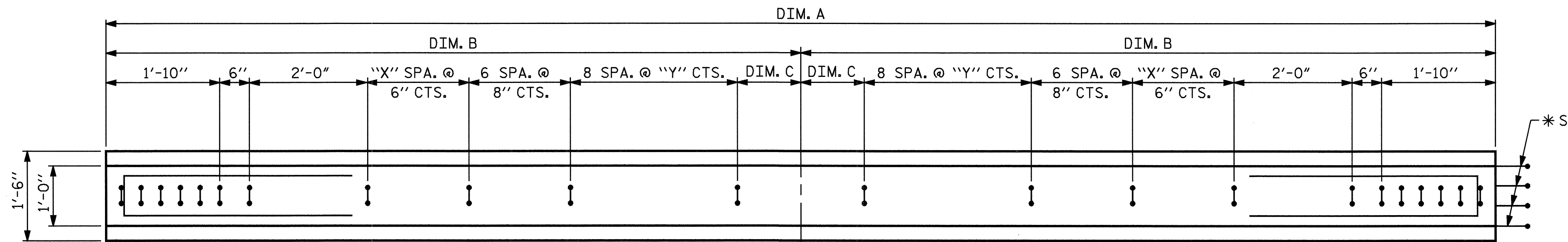
(S1 BARS NOT SHOWN)



AT END OF GIRDER

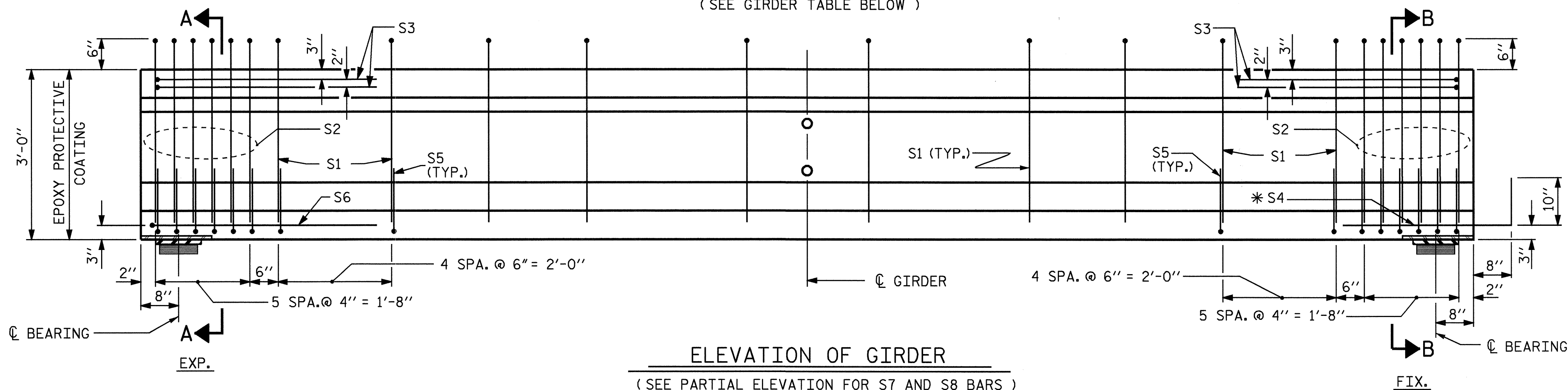
AT C. OF GIRDER

1/2" Ø LOW RELAXATION STRAND LAYOUT



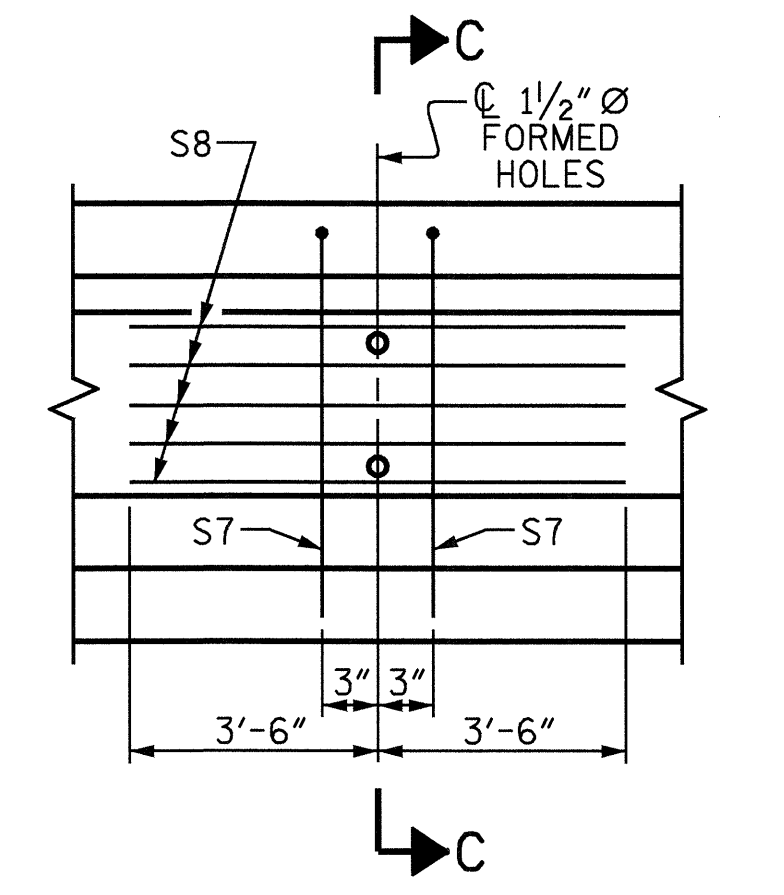
PLAN OF GIRDER

(SEE GIRDER TABLE BELOW)



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR S7 AND S8 BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

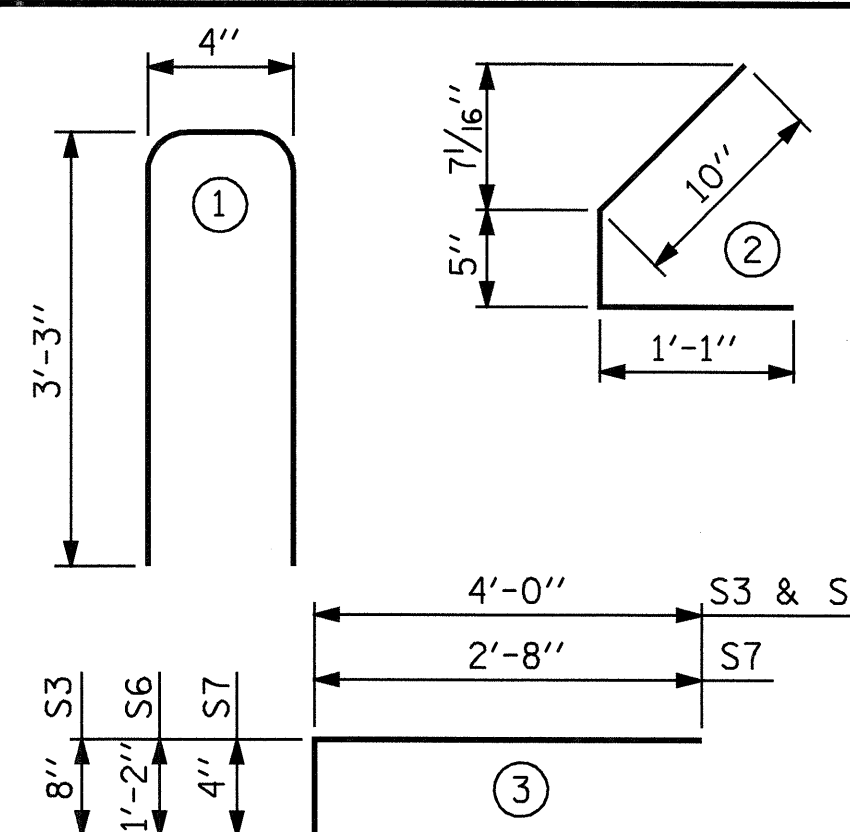
1/2" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GDR.'s 1 THRU 4	S1	52	#4	1	6'-10"	237
GDR. 5	S1	50	#4	1	6'-10"	228
	S2	12	#5	1	6'-10"	86
	S3	4	#4	3	8'-8"	23
	*S4	4	#5	STR	3'-8"	15
	S5	44	#4	2	2'-4"	69
	S6	1	#4	3	9'-2"	6
	S7	2	#5	3	5'-8"	12
	S8	5	#4	STR	7'-0"	23

\* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

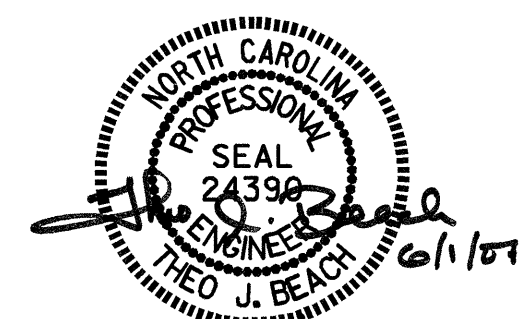
	REINFORCING STEEL	6,000 PSI CONCRETE	1/2" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS 1 THRU 4	471	4.4	20
GIRDER 5	462	4.3	20

GIRDERS REQUIRED

GIRDER	LENGTH	TOTAL LENGTH
GDR.'s A1 & D1	46'-9 1/4"	93.54'
GDR.'s A2 & D2	46'-3 3/4"	92.63'
GDR.'s A3 & D3	45'-10 3/8"	91.73'
GDR.'s A4 & D4	45'-4 7/8"	90.81'
GDR.'s A5 & D5	44'-11 1/2"	89.92'

PROJECT NO. B-3917  
 WAKE COUNTY  
 STATION: 16+96.50 -L-

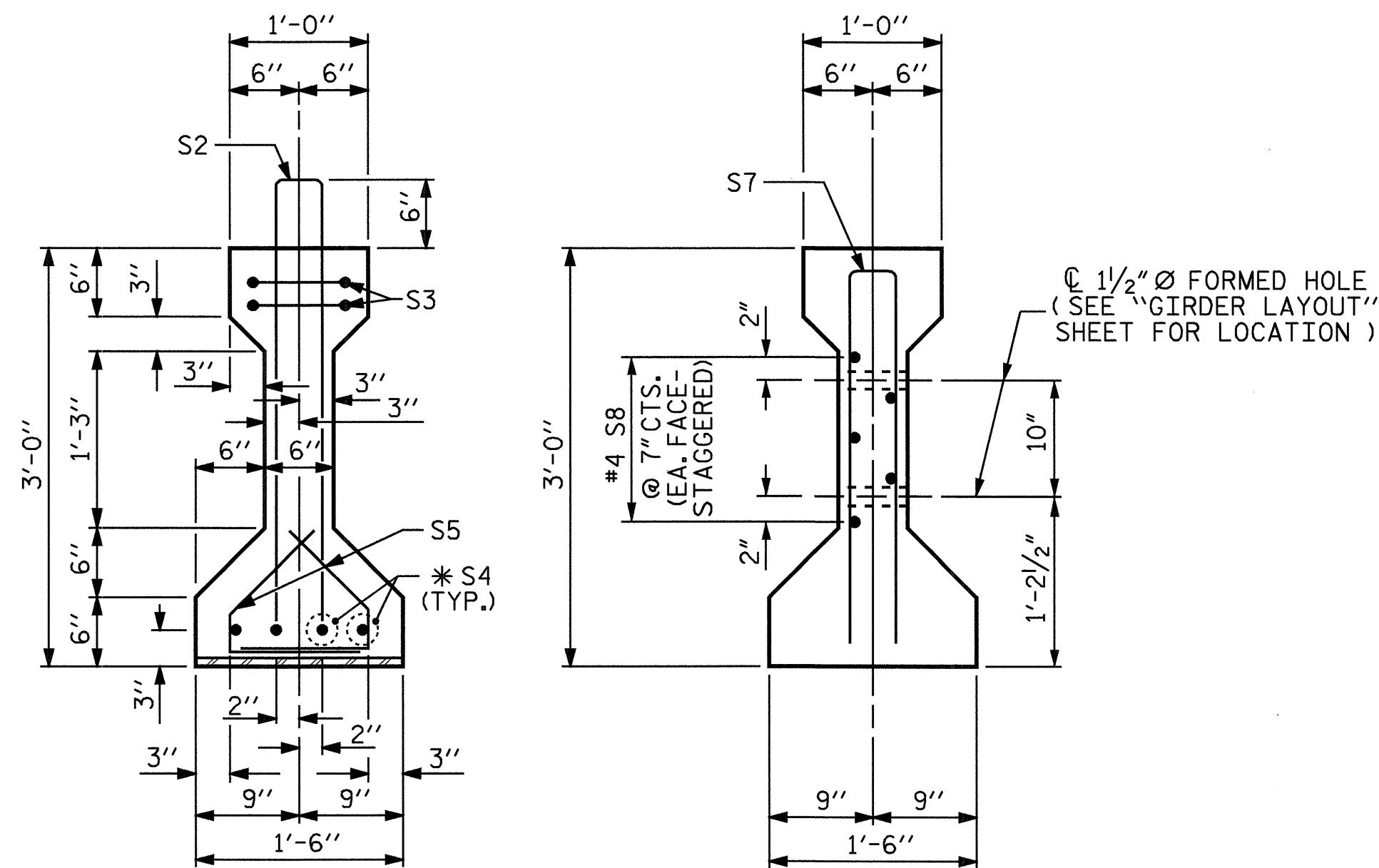
GIRDER TABLE ( SPANS "A & "D" )					
GIRDER	DIM. A	DIM. B	DIM. C	"X" SPACES	"Y" CTS.
GDR.'s A1 & D1	46'-9 1/4"	23'-4 5/8"	6 5/8"	7 SPACES	1'-4 1/2" CTS.
GDR.'s A2 & D2	46'-3 3/4"	23'-1 7/8"	11 7/8"	7 SPACES	1'-3 1/2" CTS.
GDR.'s A3 & D3	45'-10 3/8"	22'-11 3/16"	9 3/16"	7 SPACES	1'-3 1/2" CTS.
GDR.'s A4 & D4	45'-4 7/8"	22'-8 7/16"	6 7/16"	7 SPACES	1'-3 1/2" CTS.
GDR.'s A5 & D5	44'-11 1/2"	22'-5 3/4"	9 3/4"	6 SPACES	1'-3 1/2" CTS.



ASSEMBLED BY : MIKE BRITT DATE : 2-2-06  
 CHECKED BY : A.K. PATEL DATE : 3-2-06  
 DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES  
 CHECKED BY : GRP 8/91 REV. 8/16/99 RWW/LES  
 REV. 10/17/00R RWW/LES

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

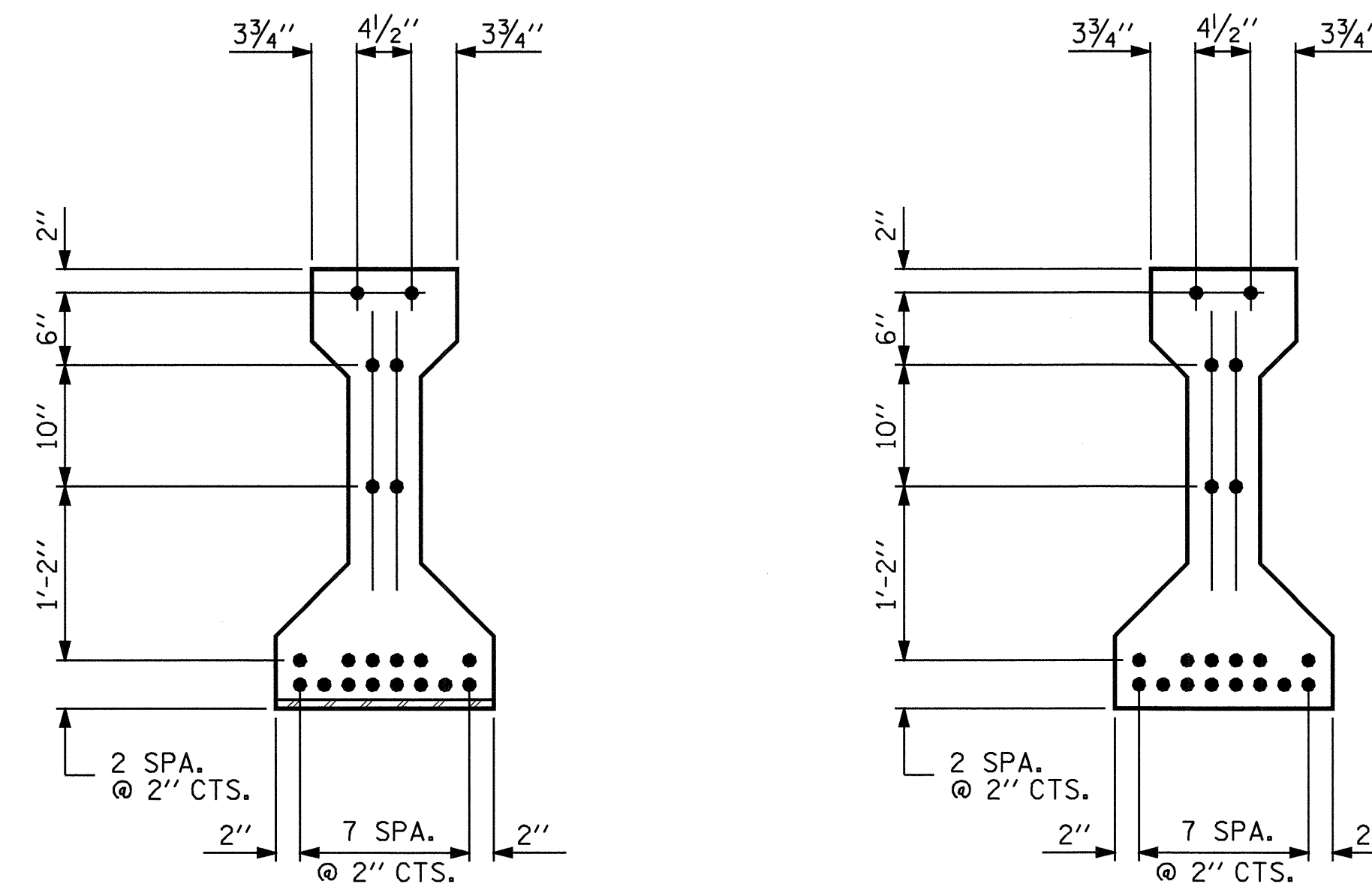




SECTION B-B

SECTION C-C

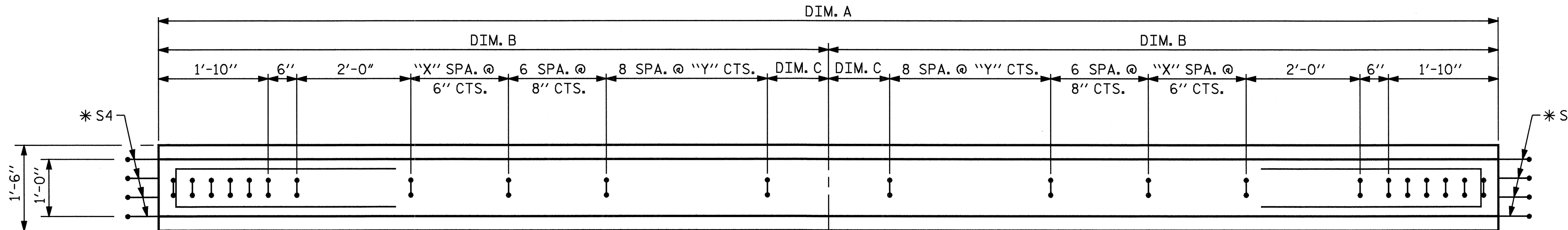
(S1 BARS NOT SHOWN)



AT END OF GIRDER

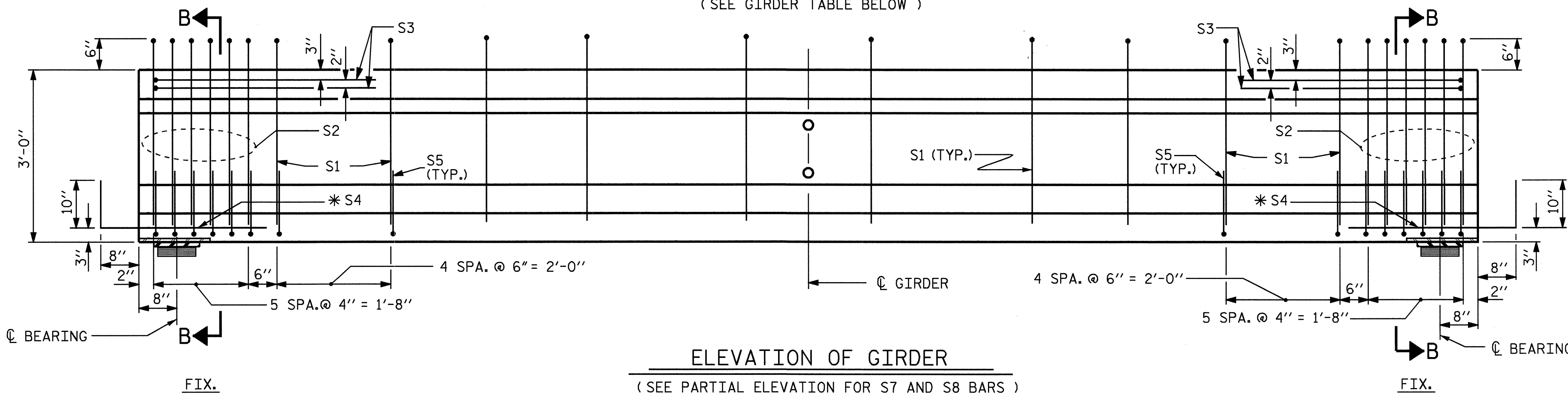
AT C OF GIRDER

1/2" Ø LOW RELAXATION STRAND LAYOUT



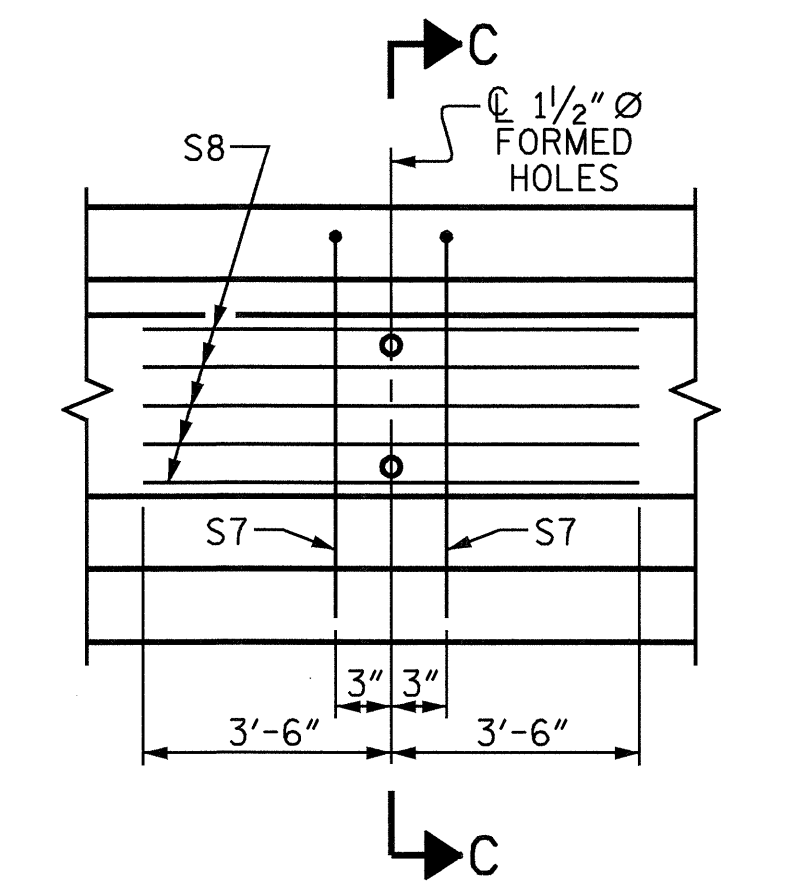
PLAN OF GIRDER

(SEE GIRDER TABLE BELOW)



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR S7 AND S8 BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

1/2" Ø L. R. GRADE 270 STRANDS

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.153	41,300	30,980

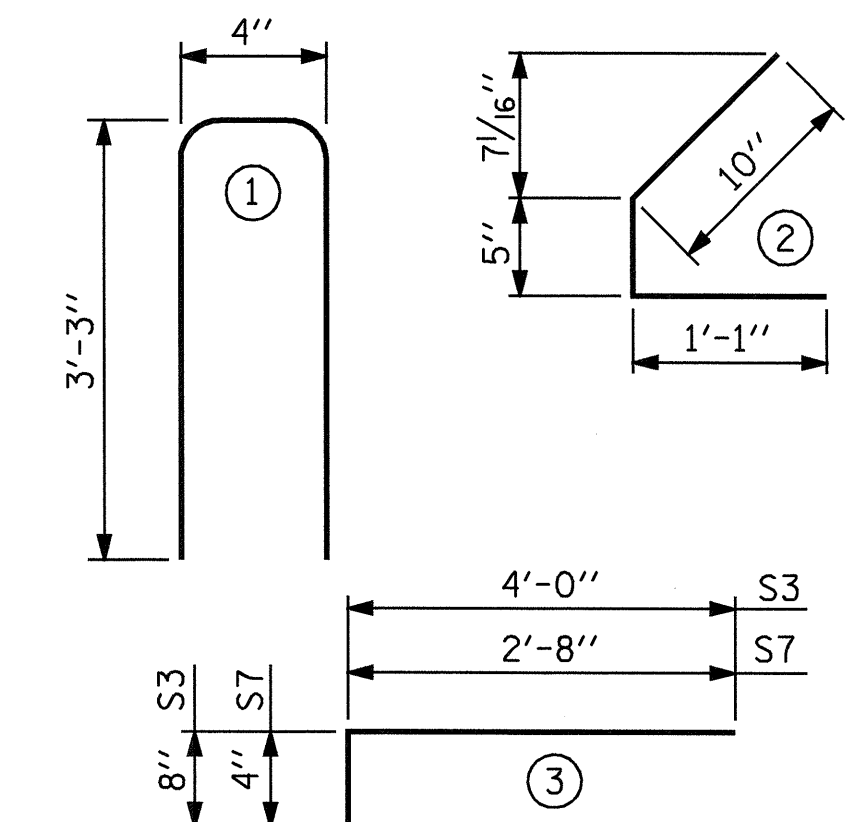
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	52	#4	1	6'-10"	237
S1	50	#4	1	6'-10"	228
S2	12	#5	1	6'-10"	86
S3	4	#4	3	8'-8"	23
*S4	8	#5	STR	3'-8"	31
S5	44	#4	2	2'-4"	69
S7	2	#5	3	5'-8"	12
S8	5	#4	STR	7'-0"	23

\* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6,000 PSI CONCRETE	1/2" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDERS 1 THRU 4	481	4.4	20
GIRDER 5	472	4.3	20

GIRDERS REQUIRED

GIRDER	LENGTH	TOTAL LENGTH
GDR.'s B1 & C1	46'-9 1/4"	93.54'
GDR.'s B2 & C2	46'-3 3/4"	92.63'
GDR.'s B3 & C3	45'-10 3/8"	91.73'
GDR.'s B4 & C4	45'-4 7/8"	90.81'
GDR.'s B5 & C5	44'-11 1/2"	89.92'

PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

GIRDER TABLE ( SPANS "B" & "C" )

GIRDER	DIM. A	DIM. B	DIM. C	"X" SPACES	"Y" CTS.
GDR.'s B1 & C1	46'-9 1/4"	23'-4 5/8"	6 5/8"	7 SPACES	1'-4 1/2" CTS.
GDR.'s B2 & C2	46'-3 3/4"	23'-1 7/8"	11 7/8"	7 SPACES	1'-3 1/2" CTS.
GDR.'s B3 & C3	45'-10 3/8"	22'-11 3/16"	9 3/16"	7 SPACES	1'-3 1/2" CTS.
GDR.'s B4 & C4	45'-4 7/8"	22'-8 7/16"	6 7/16"	7 SPACES	1'-3 1/2" CTS.
GDR.'s B5 & C5	44'-11 1/2"	22'-5 3/4"	9 3/4"	6 SPACES	1'-3 1/2" CTS.



ASSEMBLED BY : MIKE BRITT DATE : 2-2-06  
CHECKED BY : A.K. PATEL DATE : 3-2-06  
DRAWN BY : ELR 8/91 REV. 7/17/98 RWW/LES  
CHECKED BY : GRP 8/91 REV. 8/16/99 RWW/LES  
REV. 10/17/00R RWW/LES

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE II  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
( FOR SPANS "B" & "C" )

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			36

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

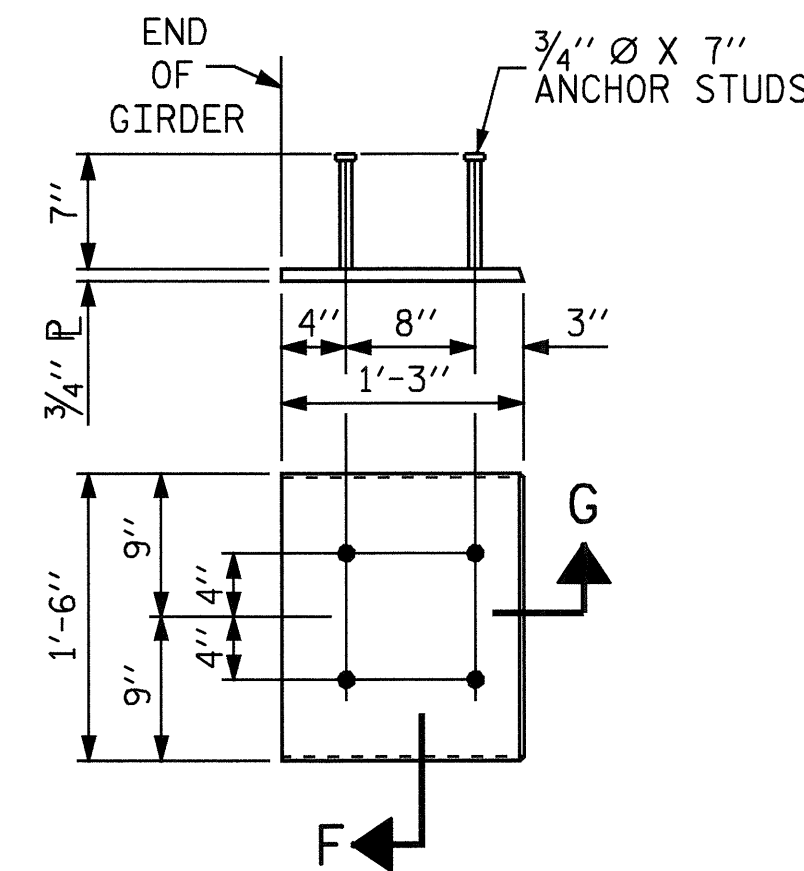
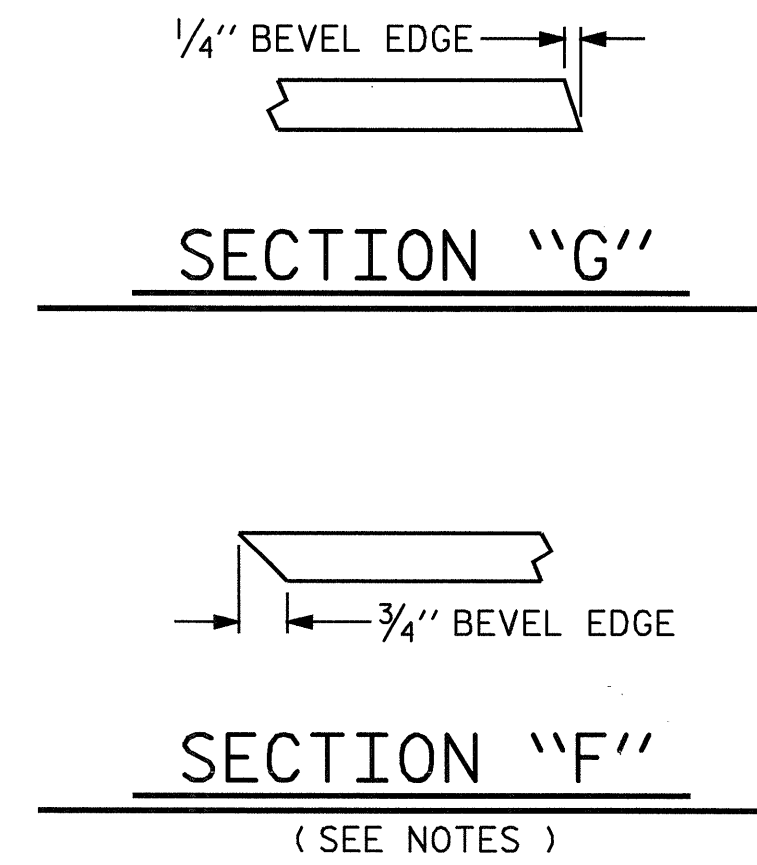
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4500 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

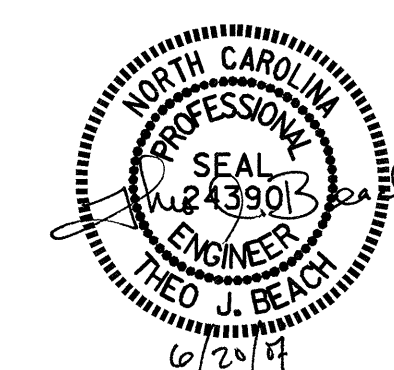


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE II GIRDER  
(2 REQ'D PER GIRDER)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																				
1/2" Ø LOW RELAXATION	SPANS "A" THRU "D"												SPANS "A" THRU "D"												SPANS "A" THRU "D"											
	GIRDER 1												GIRDERS 2 THRU 4												GIRDER 5											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0		
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0	0.027	0.051	0.070	0.082	0.086	0.082	0.070	0.051	0.027	0	0	0.027	0.050	0.069	0.081	0.085	0.081	0.069	0.050	0.027	0	0	0.026	0.049	0.066	0.078	0.082	0.078	0.066	0.049	0.026	0			
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.012	0.022	0.030	0.035	0.037	0.035	0.030	0.022	0.012	0	0	0.012	0.023	0.031	0.036	0.038	0.036	0.031	0.023	0.012	0	0	0.009	0.018	0.024	0.028	0.030	0.028	0.024	0.018	0.009	0			
FINAL CAMBER ↑	0	3/16"	3/8"	1/2"	9/16"	9/16"	9/16"	1/2"	3/8"	3/16"	0	0	3/16"	5/16"	7/16"	9/16"	9/16"	7/16"	5/16"	3/16"	0	0	3/16"	3/8"	1/2"	5/8"	5/8"	5/8"	1/2"	3/8"	3/16"	0				

\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS

ASSEMBLED BY : MIKE BRITT DATE : 2-9-06  
 CHECKED BY : A.K. PATEL DATE : 3-2-06  
 DRAWN BY : ELR 11/91 REV. 8/16/99 MAB/LES  
 CHECKED BY : GRP 11/91 REV. 10/17/00 RWW/LES  
 REV. 7/10/01RR LES/RDR

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 36



STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE CHANNELS, ANGLES, BOLTS, WASHERS, PLATE WASHERS AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, OR METALLIZED. FOR METALLIZATION, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

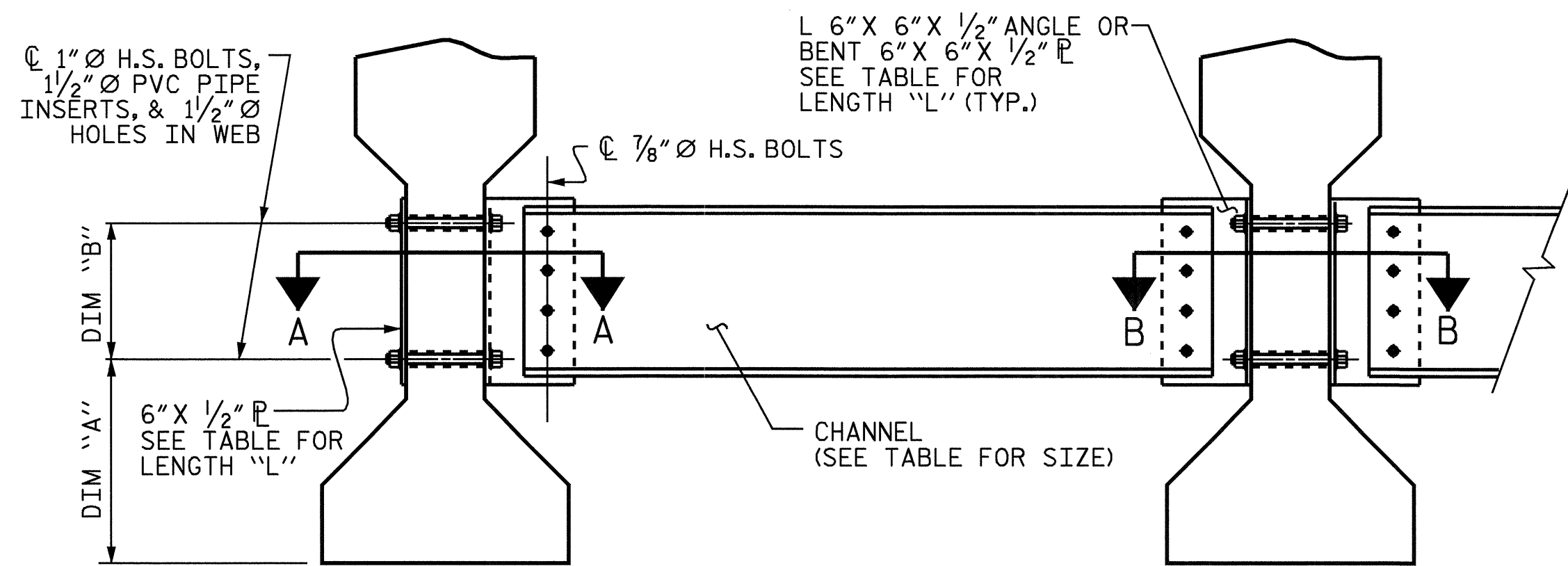
INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

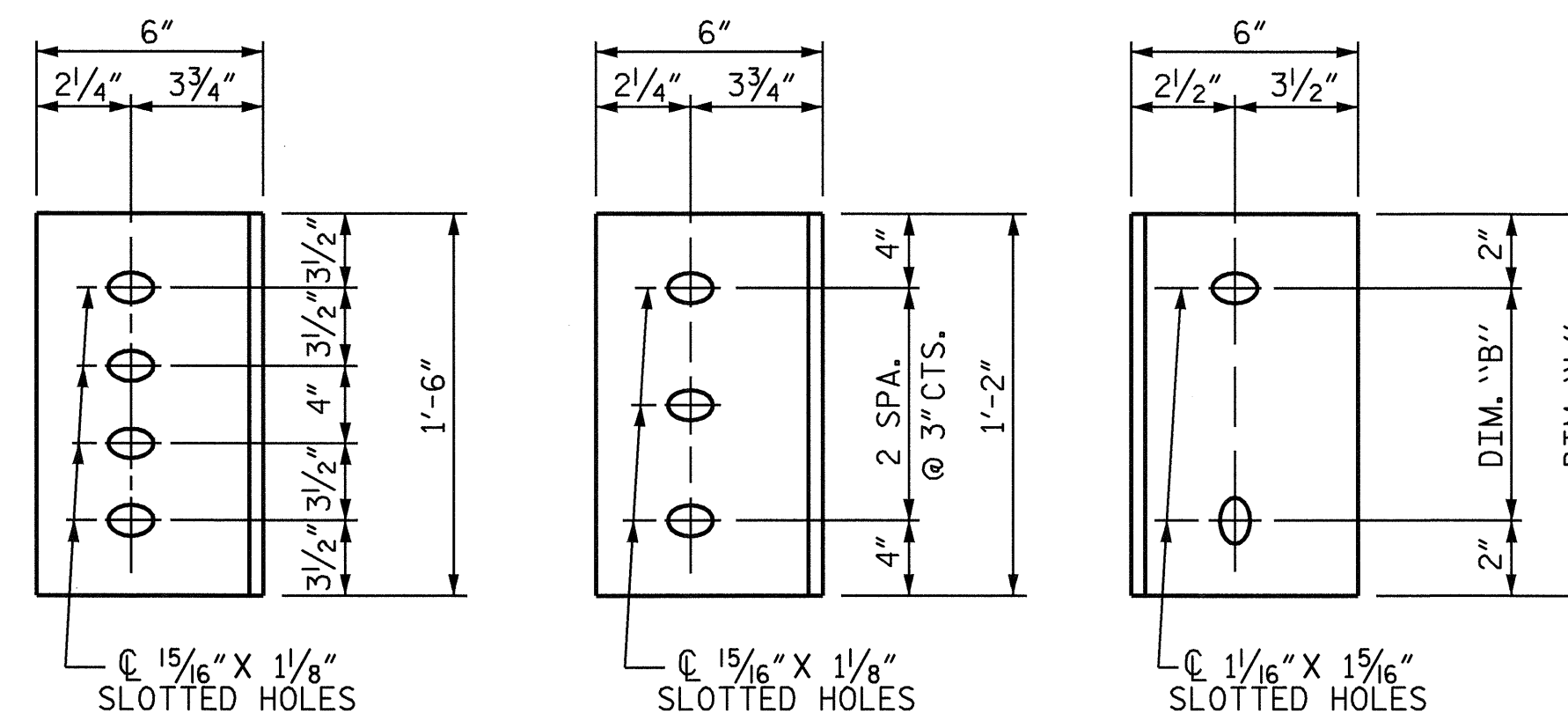
FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.



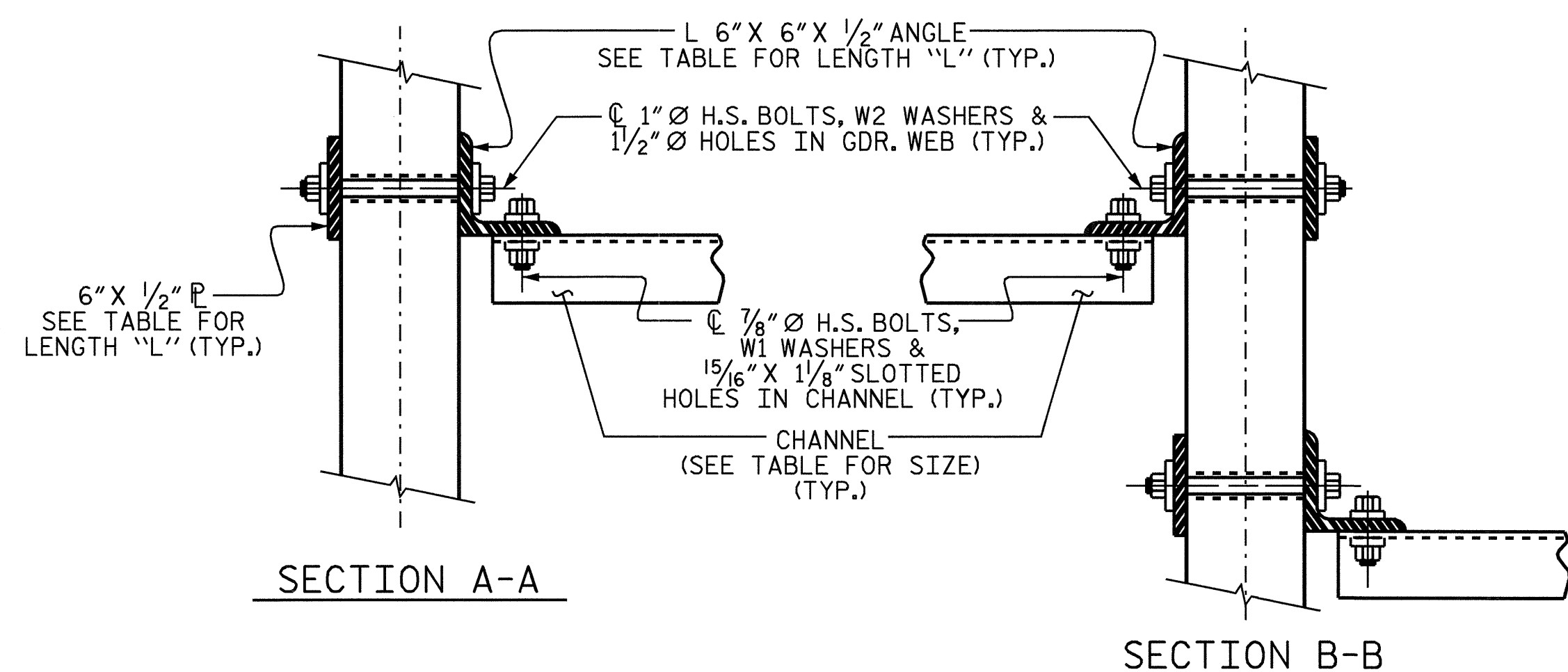
EXTERIOR GIRDER INTERIOR GIRDER  
PART SECTION AT INTERMEDIATE DIAPHRAGM  
(TYPE III OR TYPE IV GIRDER SHOWN)

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2 1/2"	10"	1'-2"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"



DIAPHRAGM FACE (TYPE III OR TYPE IV GDR.) DIAPHRAGM FACE (TYPE II GDR.) WEB FACE  
CONNECTOR PLATE DETAILS



CONNECTION DETAILS  
(FOR SKEW < 70° OR SKEW > 110°)

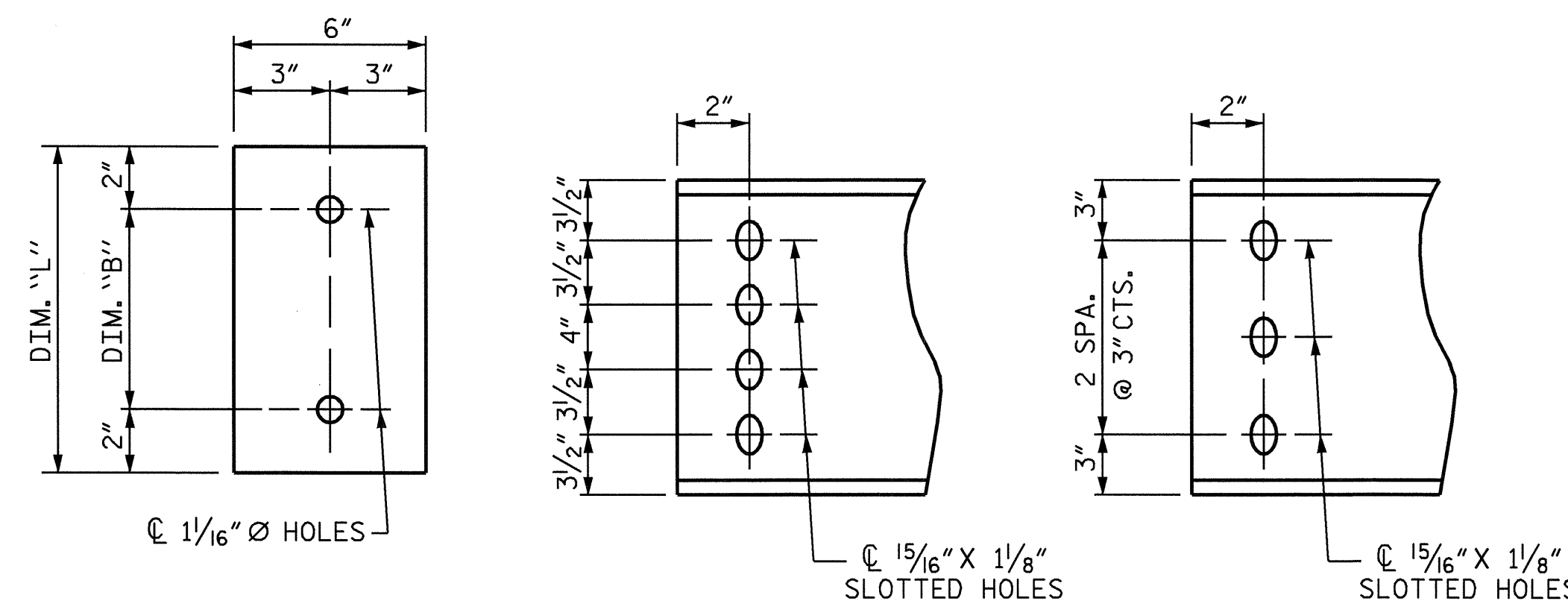
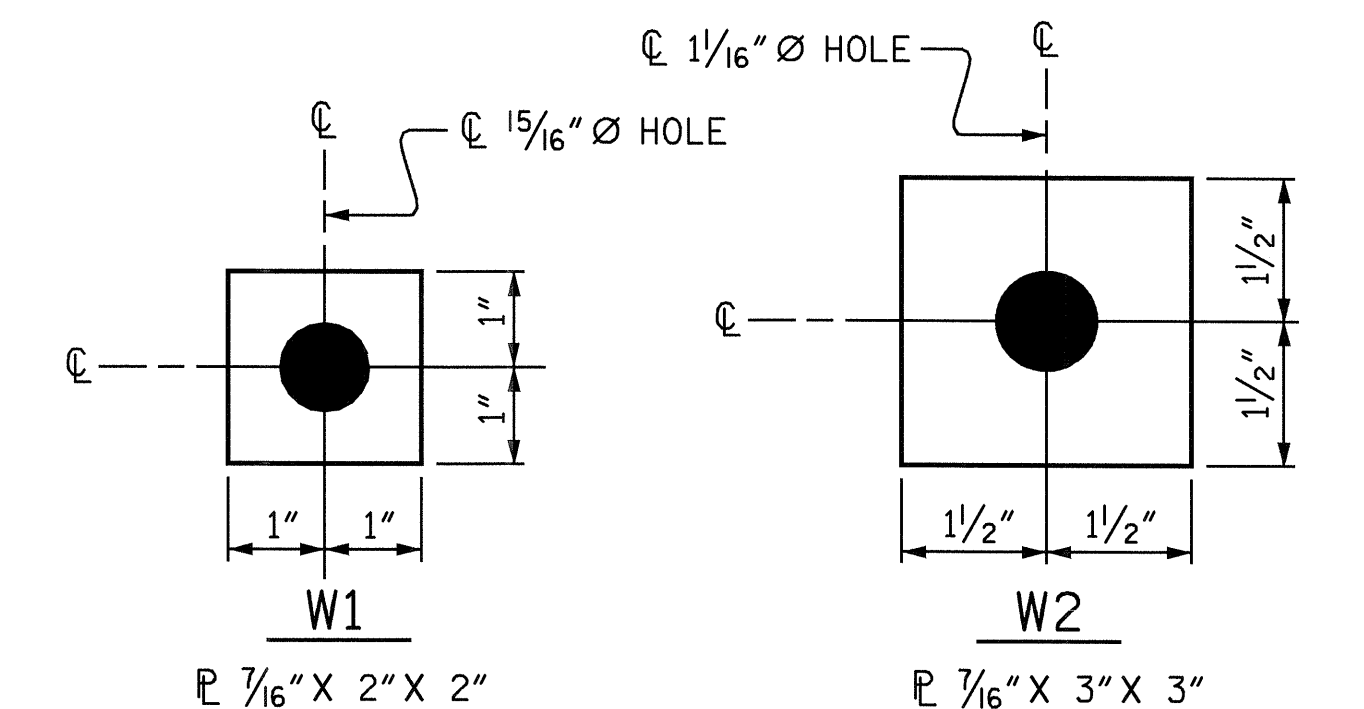
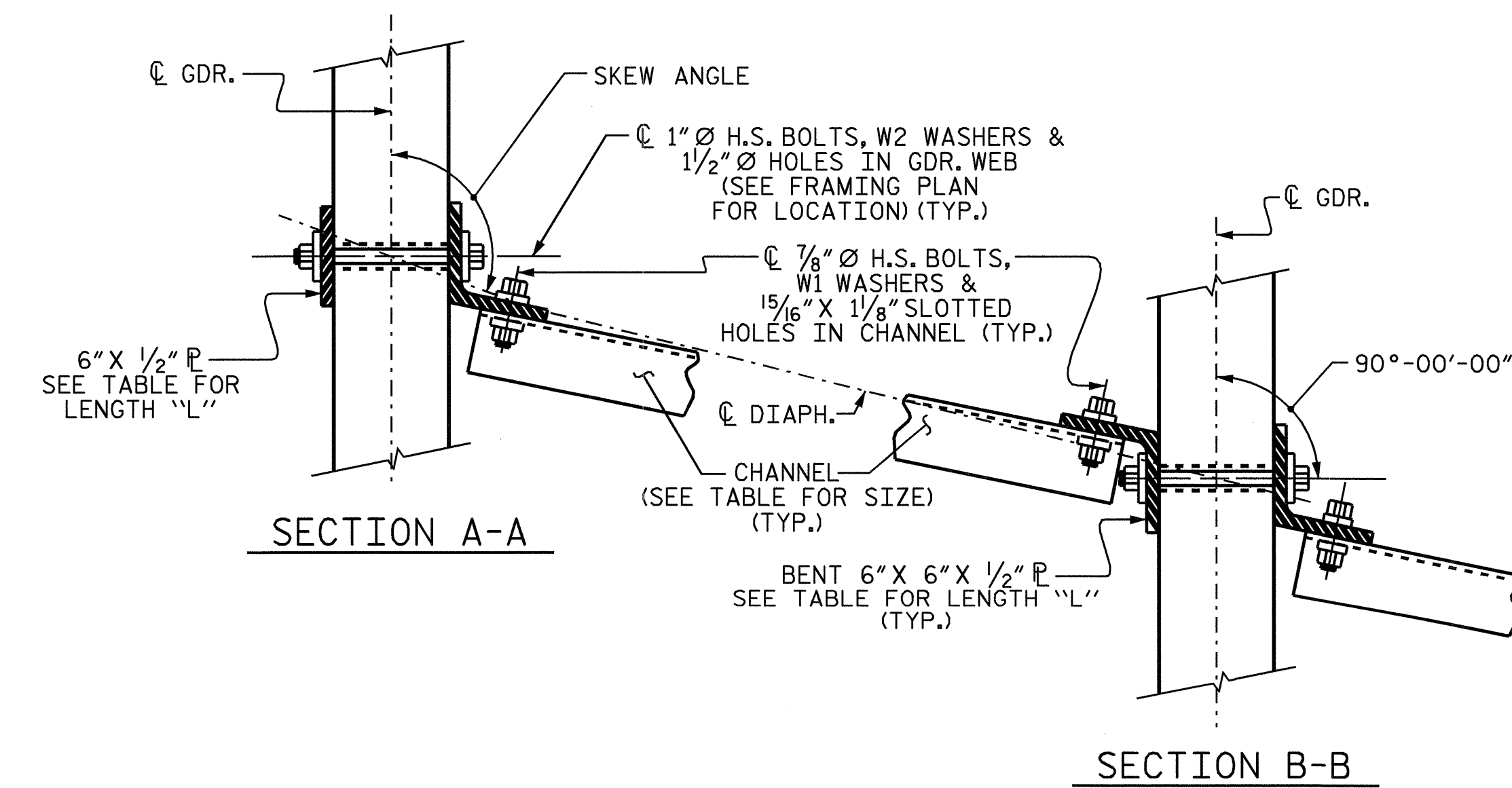


PLATE DETAILS CHANNEL END (TYPE III OR TYPE IV GDR.) CHANNEL END (TYPE II GDR.)

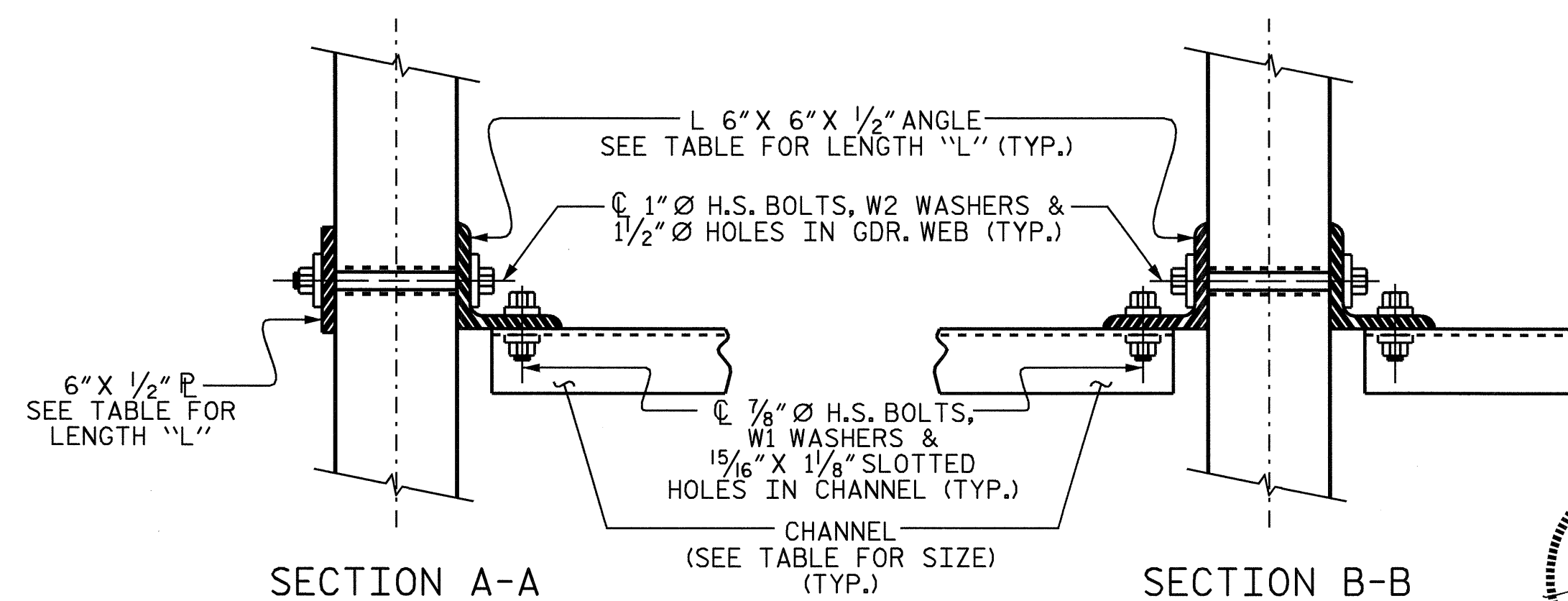


USE WITH 7/8" HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS  
USE WITH 1" HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

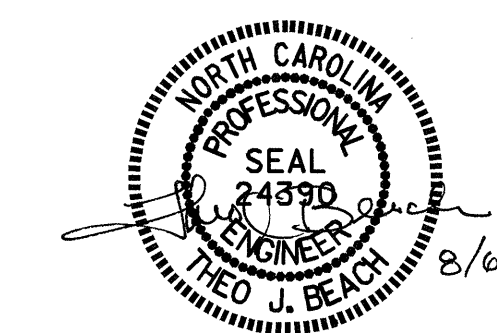
WASHER DETAILS



CONNECTION DETAILS  
(FOR 70° ≤ SKEW < 90° OR 90° < SKEW ≤ 110°)



CONNECTION DETAILS  
(FOR SKEW = 90°)



PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 36
2			4			

ASSEMBLED BY : MIKE BRITT DATE : 1-6-06  
CHECKED BY : A.K. PATEL DATE : 3-7-06  
DRAWN BY : TLA 6/05 ADDED 10/21/05  
CHECKED BY : VC 6/05



**NOTES**

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

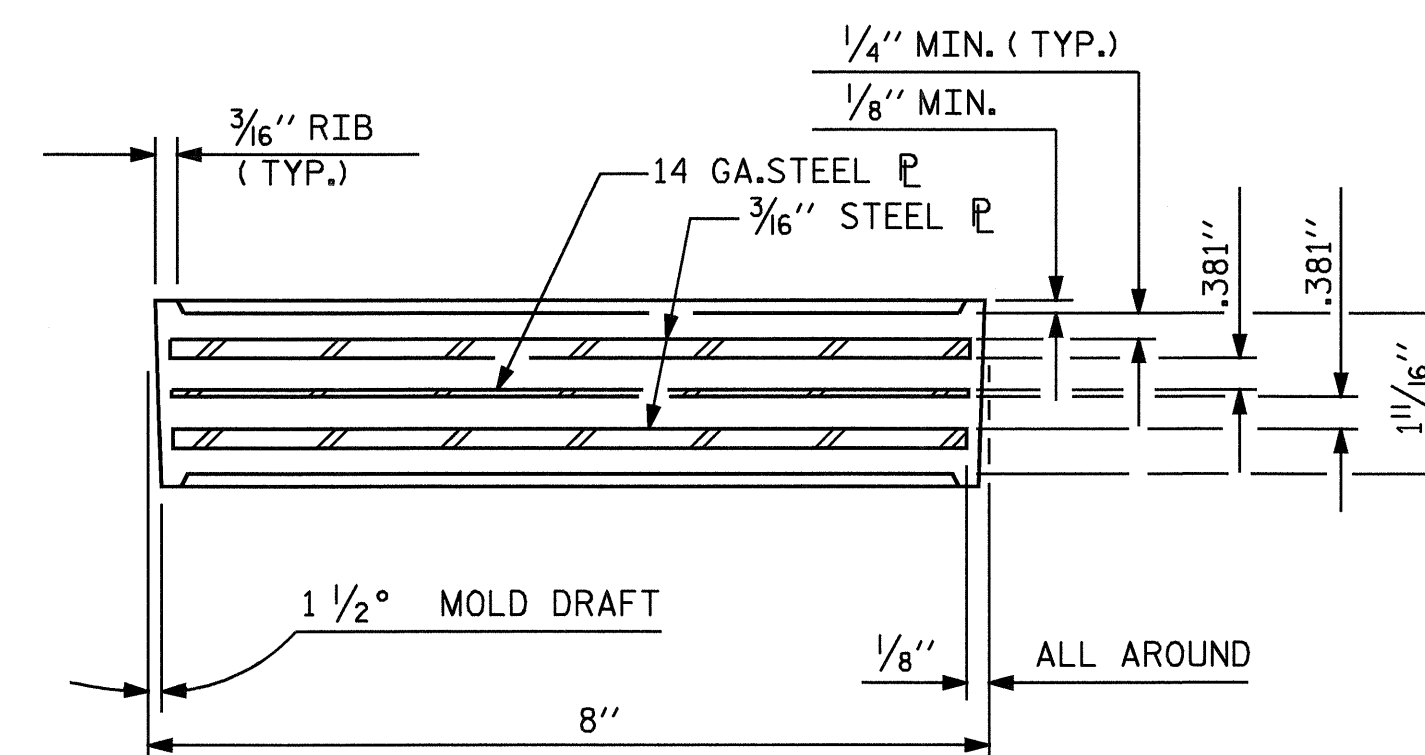
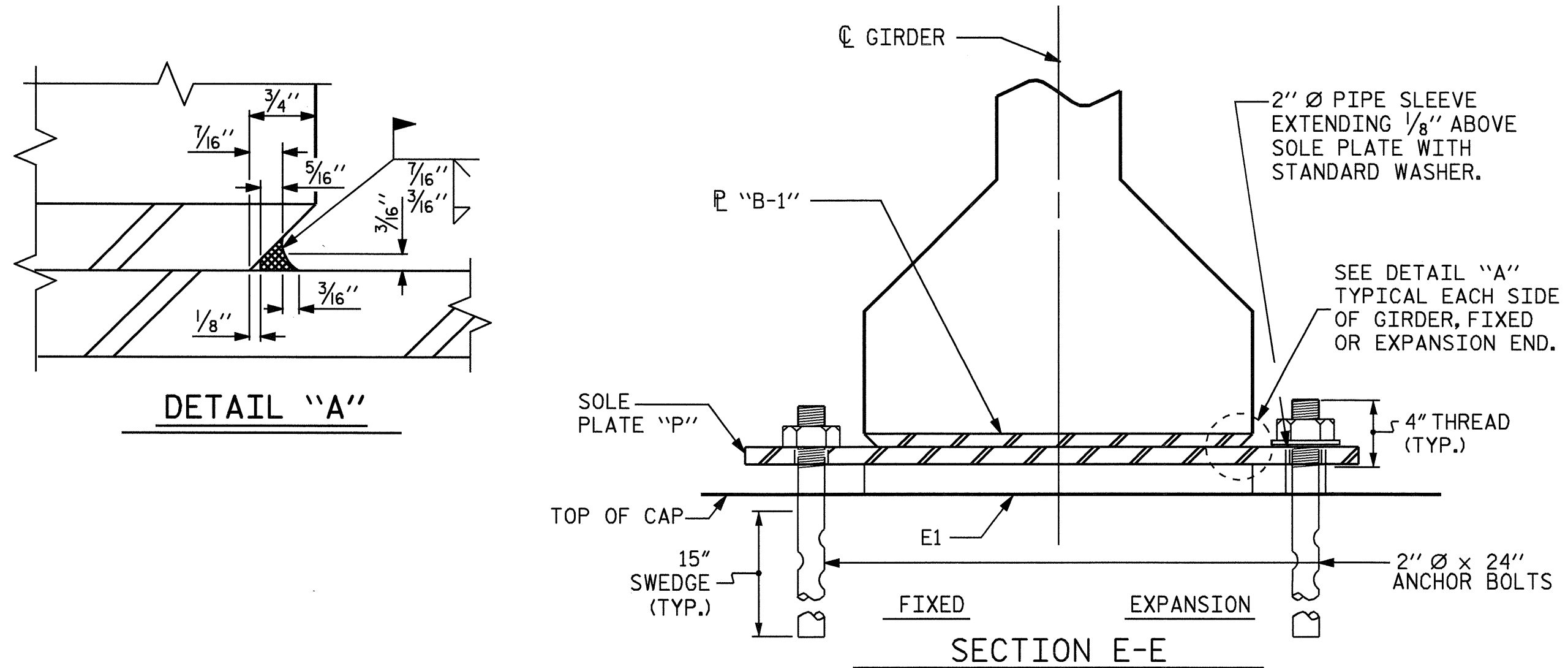
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

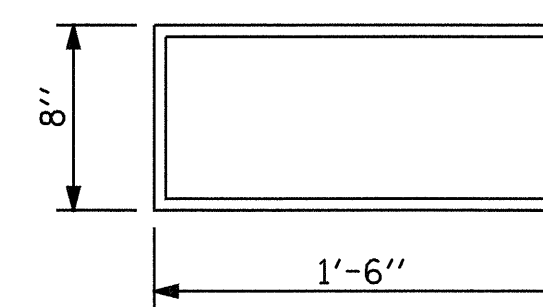
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

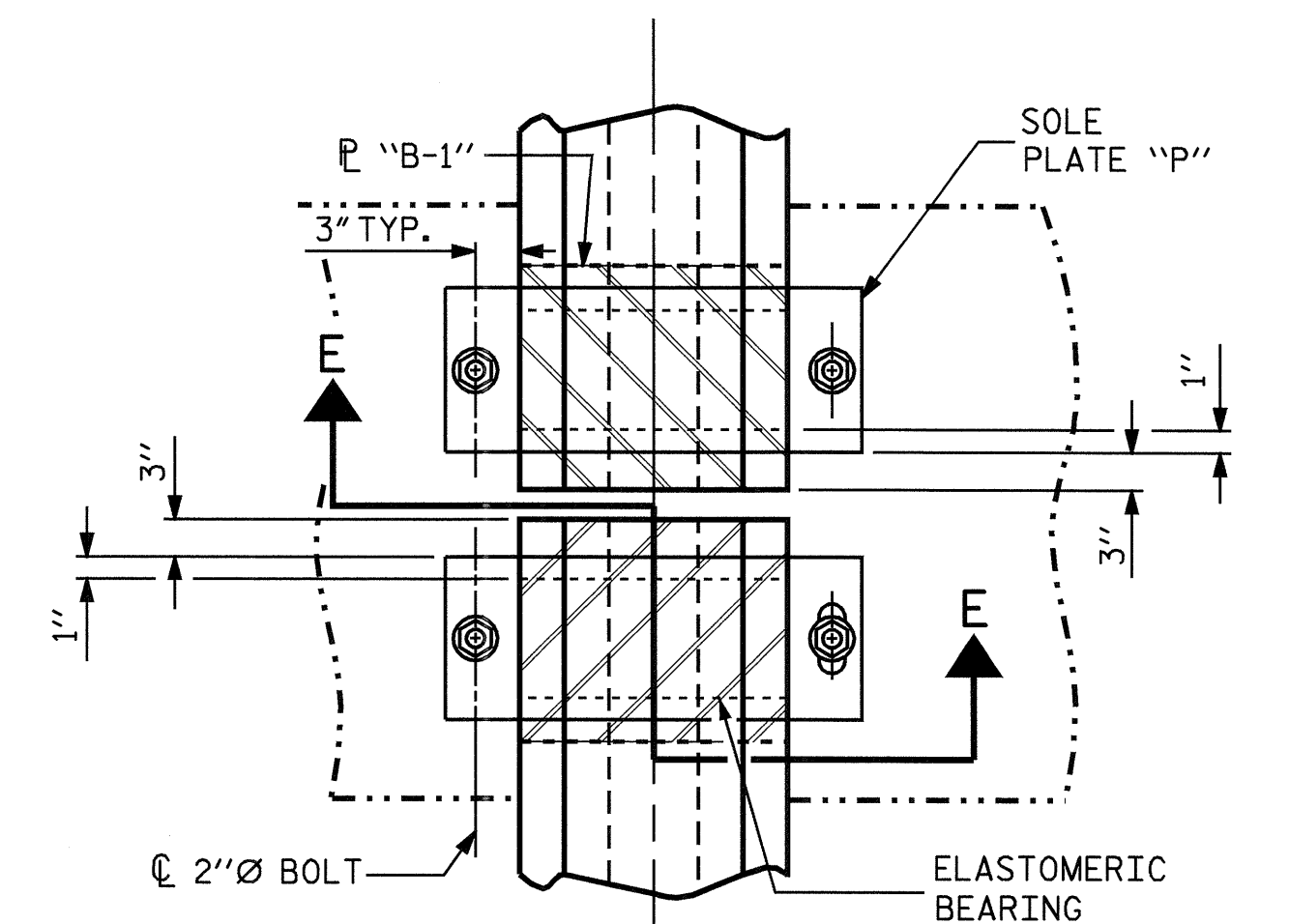


TYPICAL SECTION OF ELASTOMERIC BEARINGS

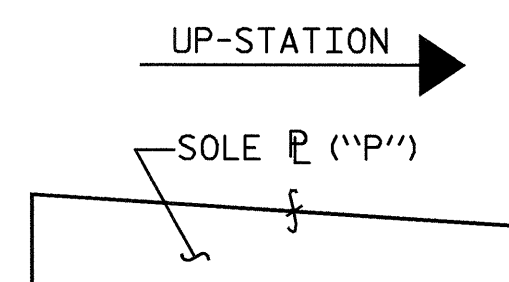


E1 (40 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

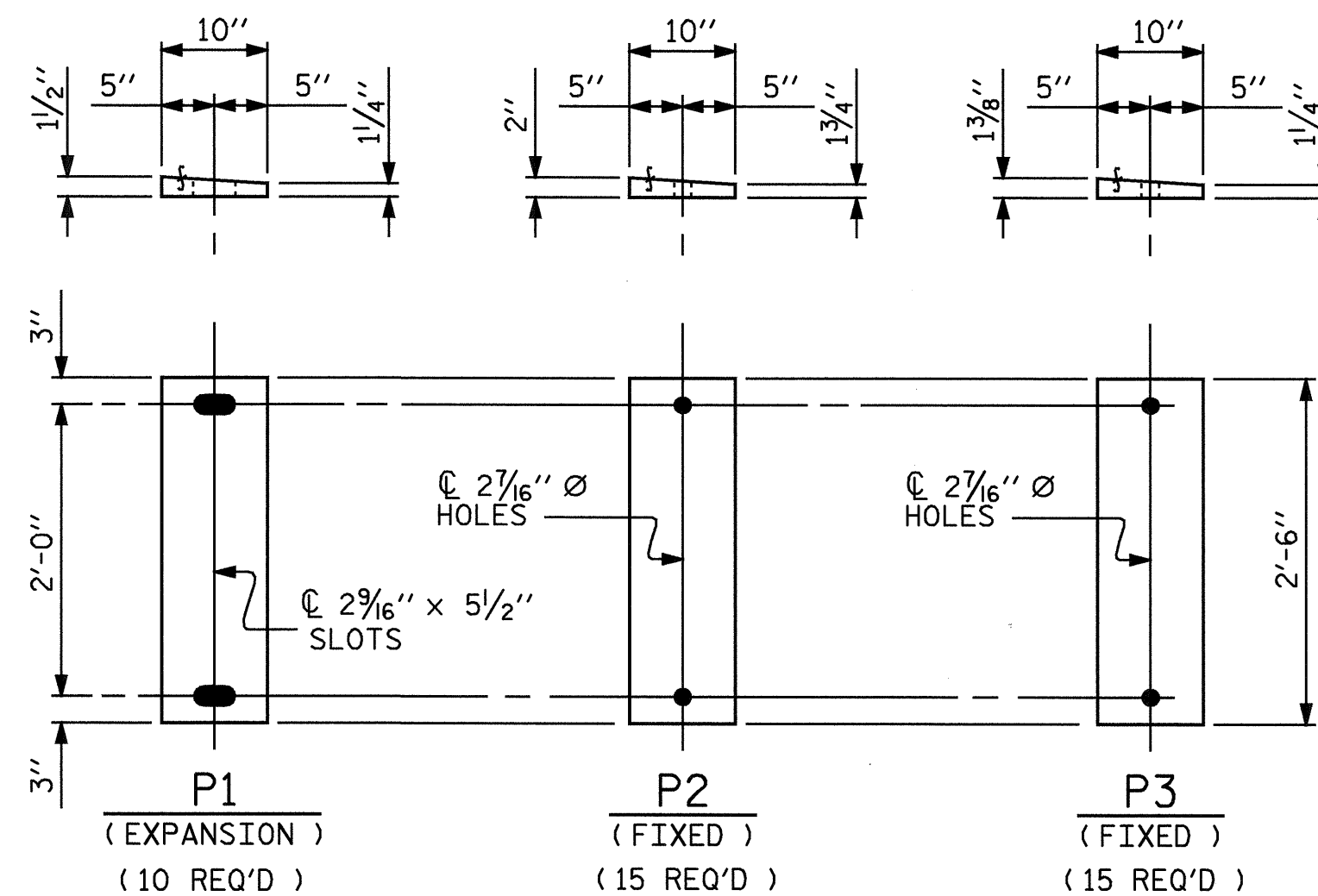
TYPE III



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)      TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE P PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

LOAD RATINGS	
	MAX.D.L.+L.L.
TYPE III	115 K

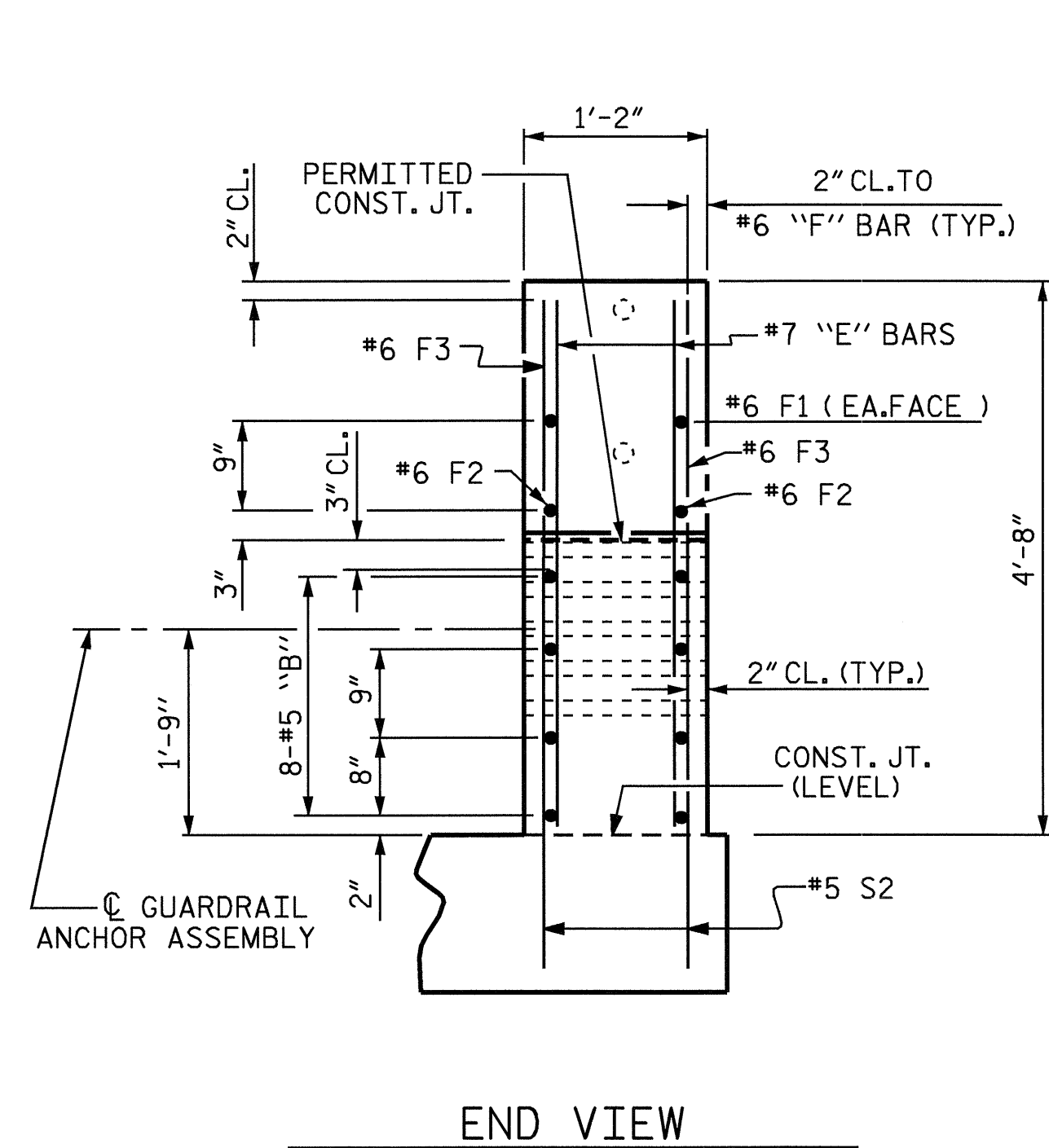


PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

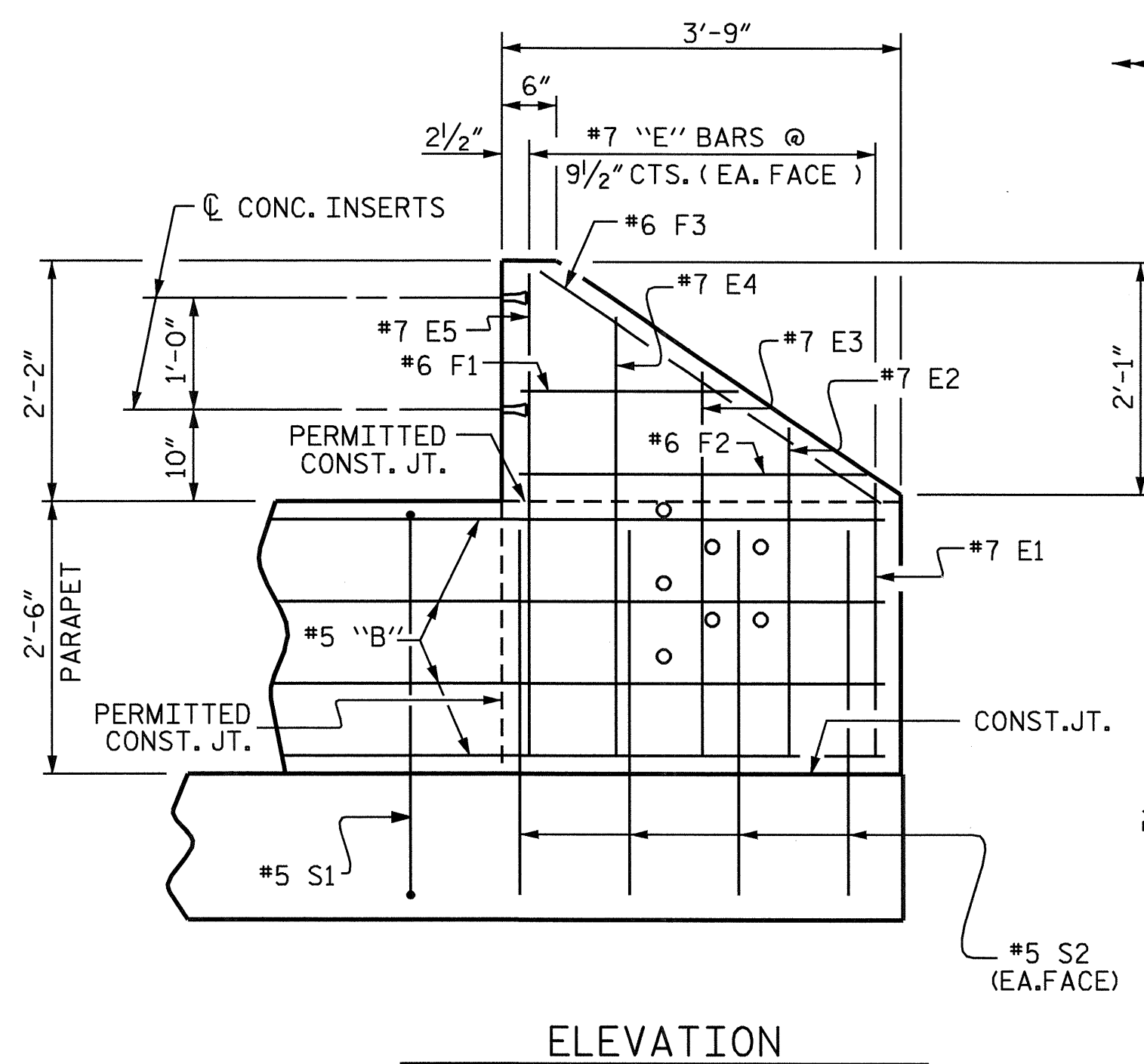
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD ELASTOMERIC BEARING DETAILS**  
 PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			36

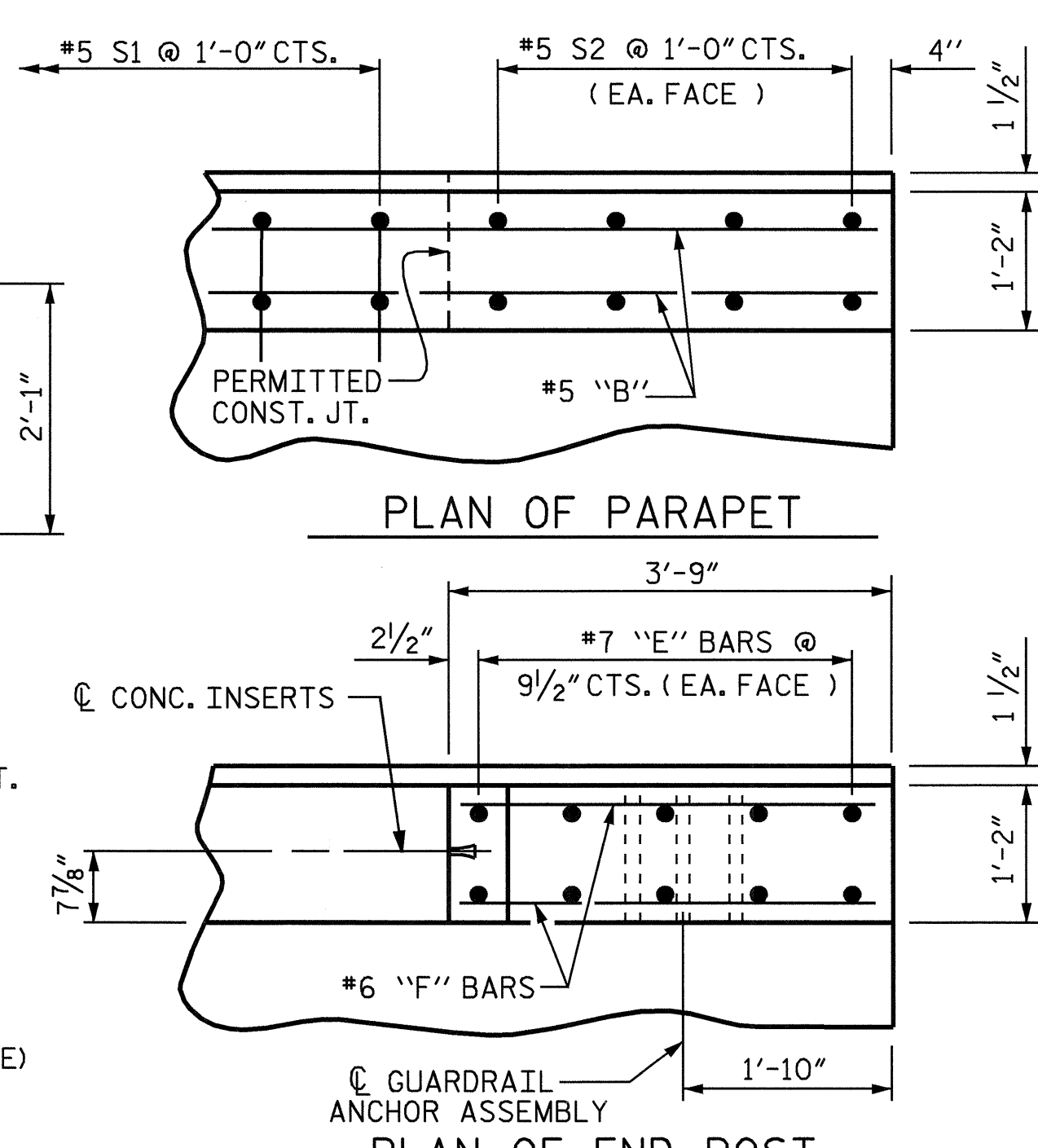
ASSEMBLED BY : MIKE BRITT	DATE : 1-12-06
CHECKED BY : A.K. PATEL	DATE : 3-6-06
DRAWN BY : WJH 8/89	REV. 8/16/99 RWW/LES
CHECKED BY : CRK 8/89	REV. 10/17/00 RWW/LES
	REV. 7/10/01 RWW/LES



END VIEW



ELEVATION



PLAN OF PARAPET

PLAN OF END POST

NOTES

THE PARAPET IN THE CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

THE #5 S1 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF PARAPET.

THE #5 S2 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S2 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

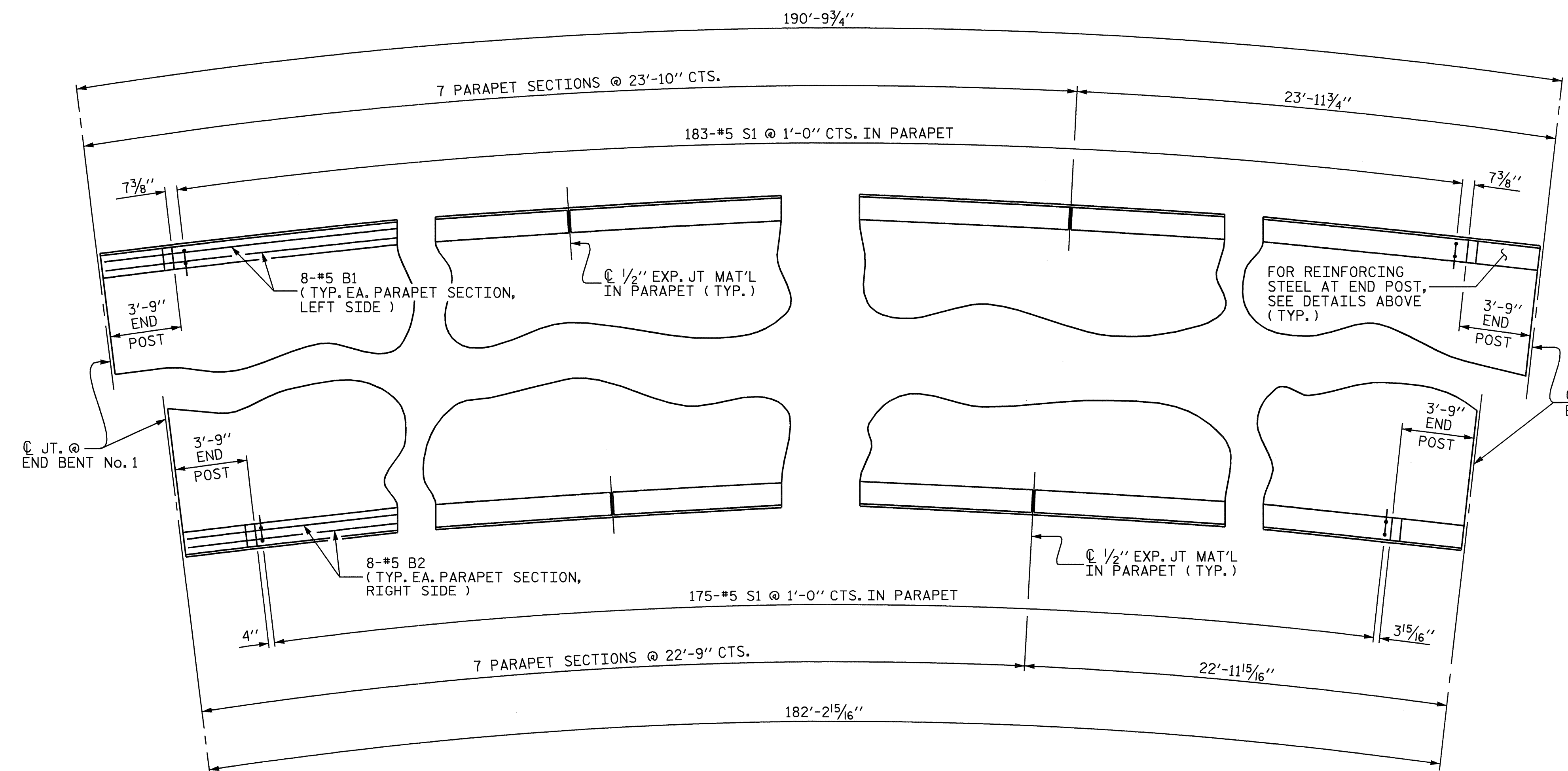
—BILL OF MATERIAL—

FOR CONCRETE PARAPET & END POST ONLY

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* B1	64	#5	STR.	23'-5"	1563
* B2	64	#5	STR.	22'-5"	1496
* E1	8	#7	STR.	2'-6"	41
* E2	8	#7	STR.	3'-0"	49
* E3	8	#7	STR.	3'-6"	57
* E4	8	#7	STR.	4'-0"	65
* E5	8	#7	STR.	4'-4"	71
* F1	8	#6	STR.	1'-10"	22
* F2	8	#6	STR.	3'-0"	36
* F3	8	#6	STR.	3'-8"	44
* S1	358	#5	1	7'-0"	2614
* S2	32	#5	STR.	3'-0"	100
* EPOXY COATED REINFORCING STEEL					6,158 LBS.
CLASS AA CONCRETE					41.1 C.Y.
CONCRETE PARAPET					373.06 L.F.

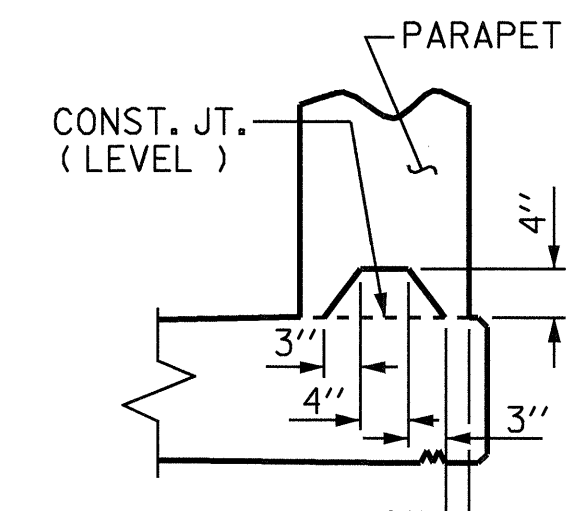
\* THESE BARS ARE EPOXY COATED

PARAPET AND END POST FOR TWO BAR RAIL



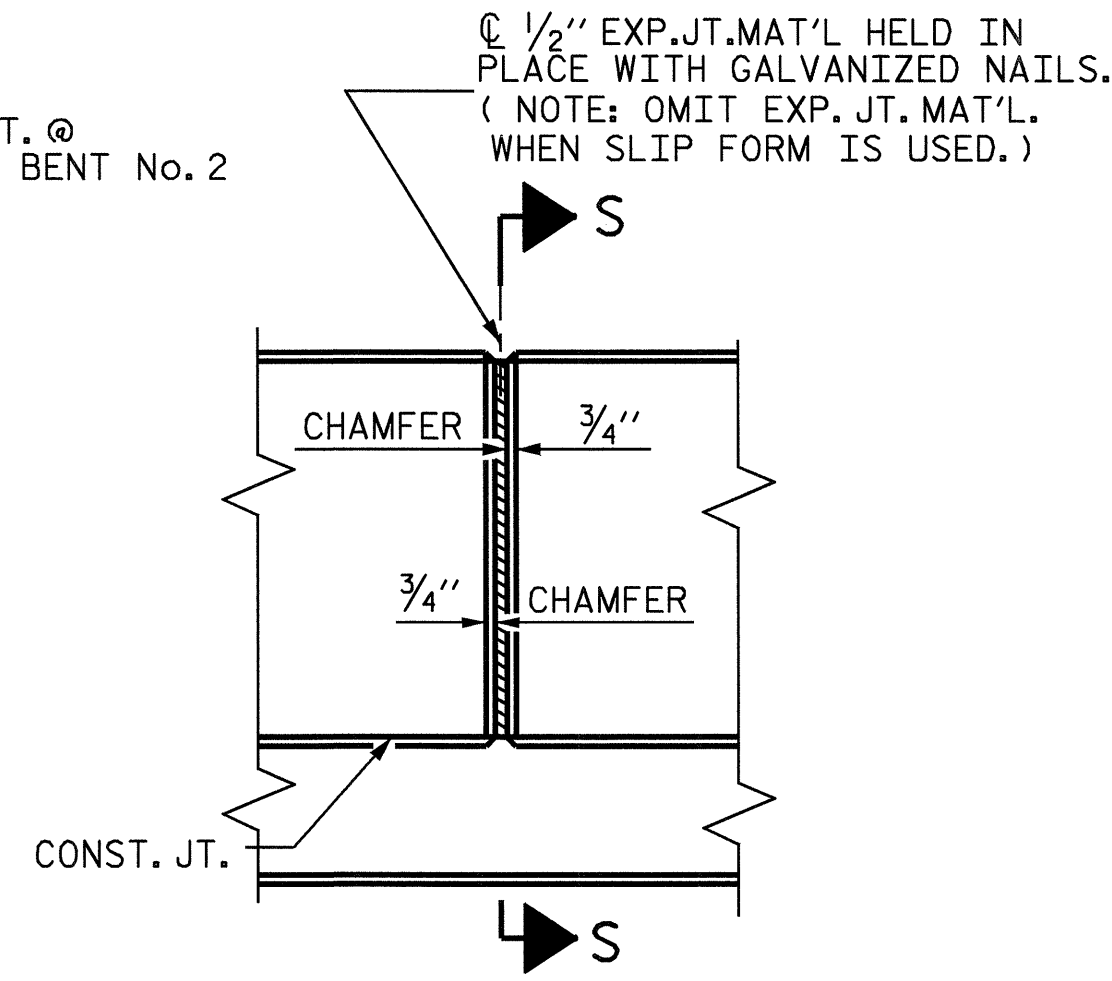
PLAN OF PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC AT THE BACK FACE OF PARAPET



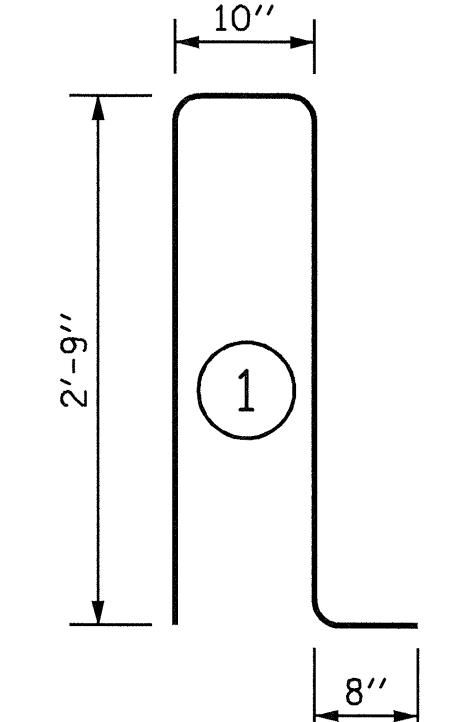
SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT



PROJECT NO. B-3917  
 WAKE COUNTY  
 STATION: 16+96.50 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 DETAILS

DRAWN BY: MIKE BRITT DATE: 2-7-06  
 CHECKED BY: A.K. PATEL DATE: 3-7-06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			36



**NOTES**

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

**GENERAL NOTES**

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 357.89 LIN. FT.

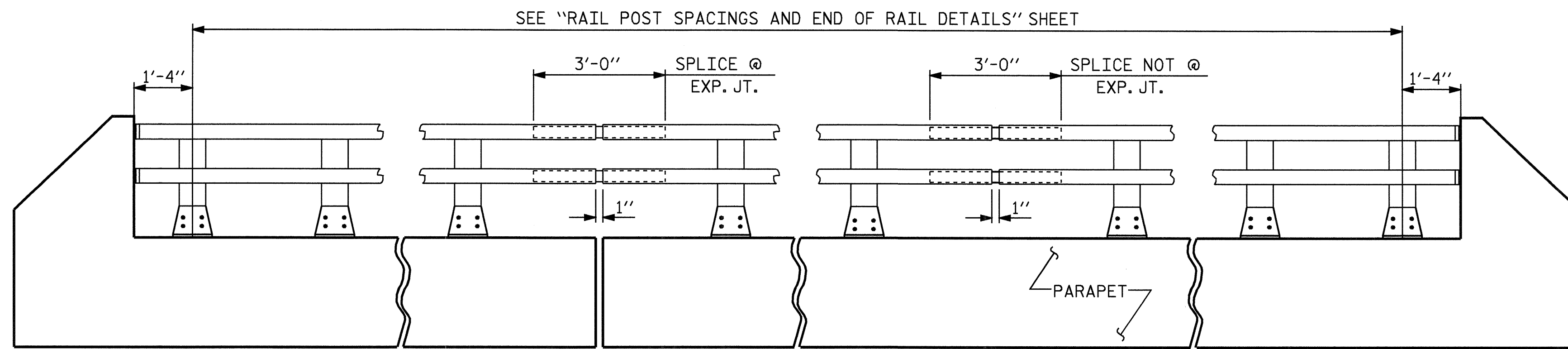
PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

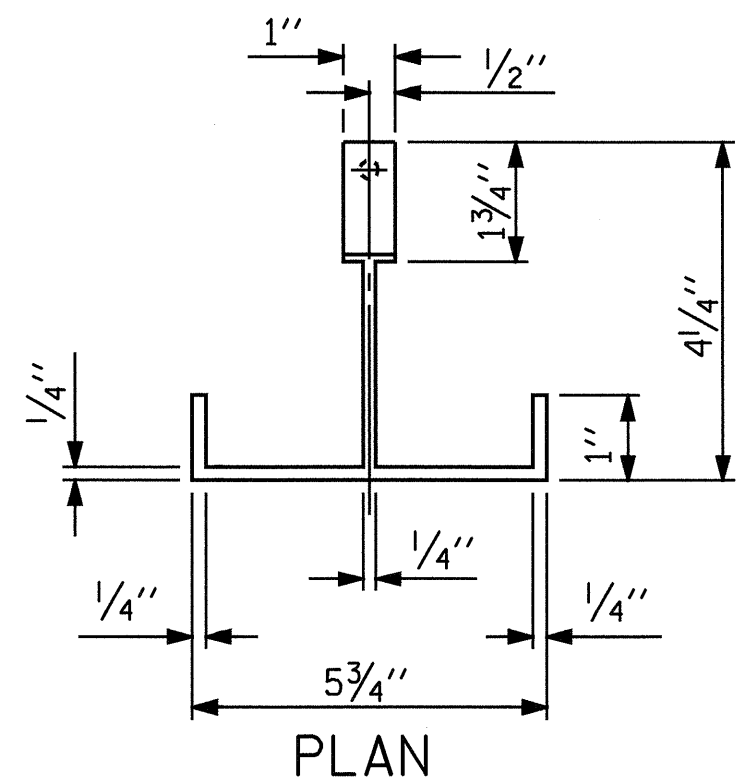


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			36

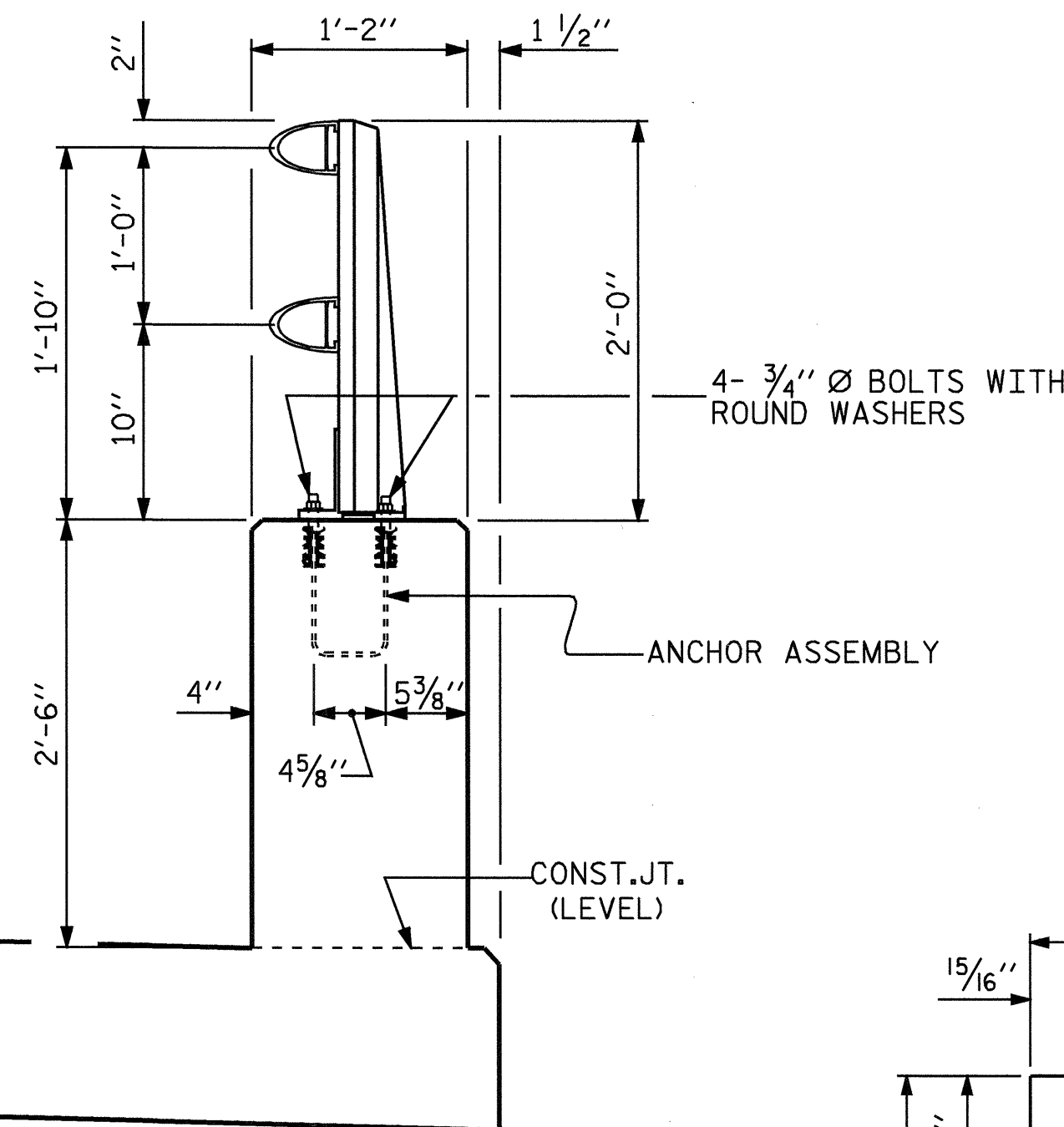


**ELEVATION**

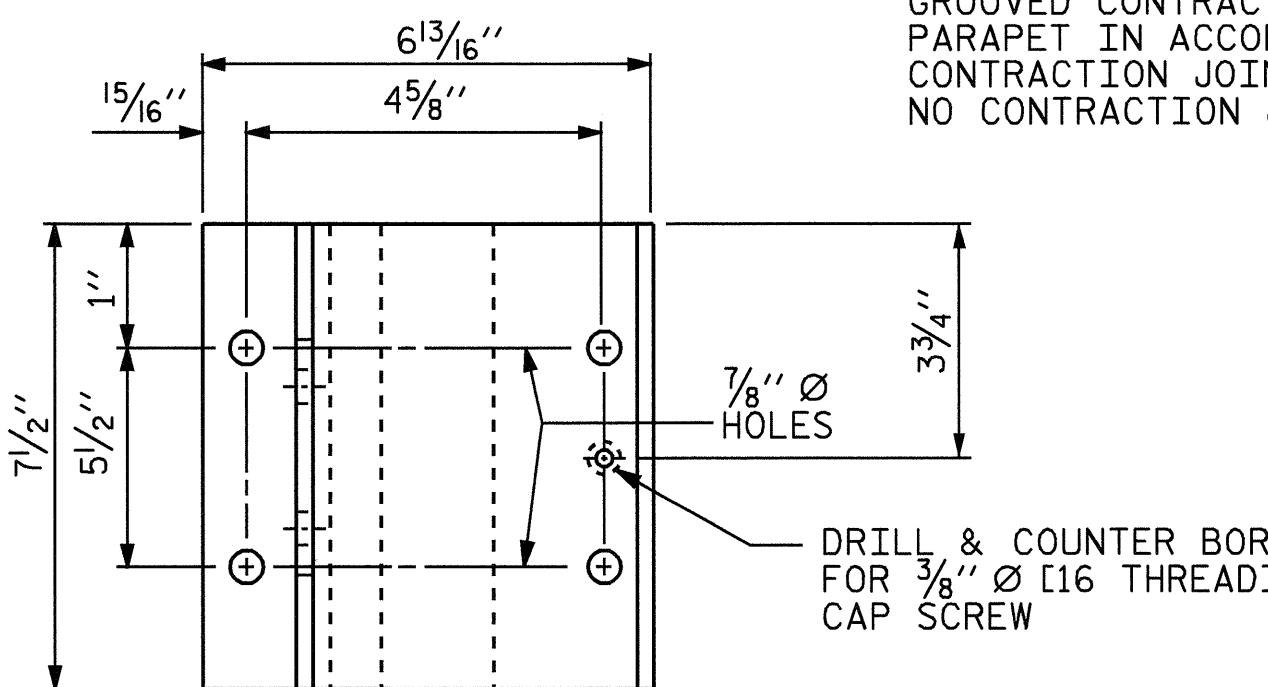
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



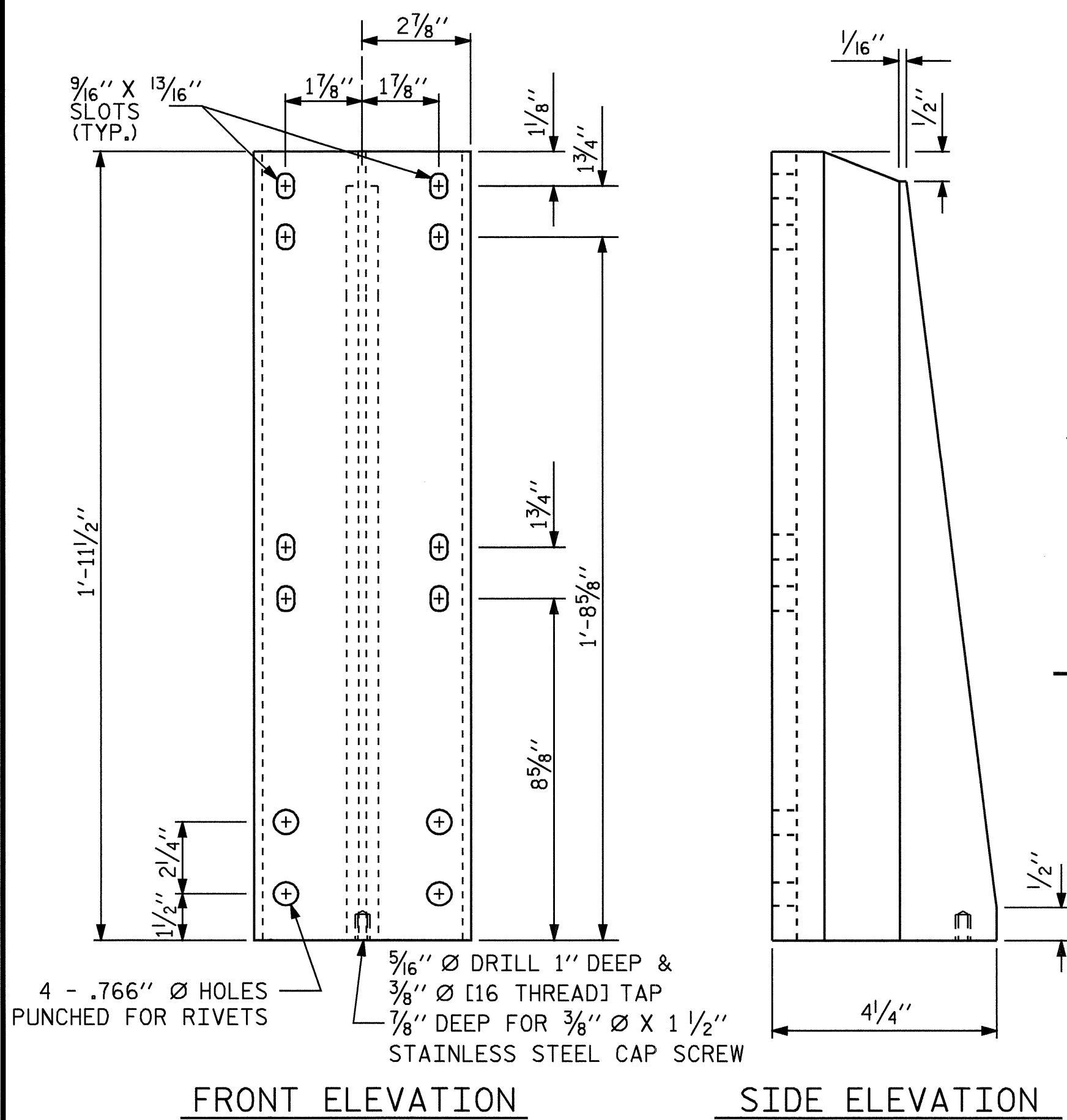
**PLAN**



**SECTION THRU PARAPET AND RAIL**



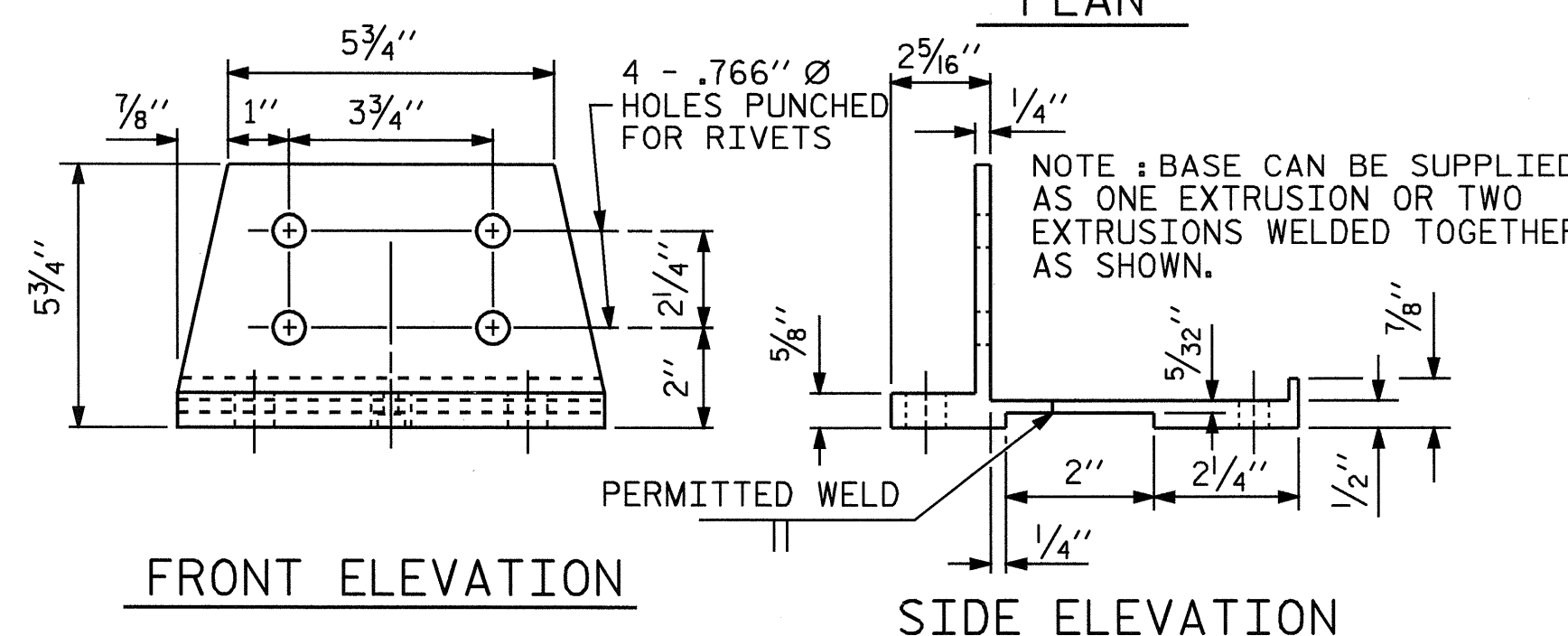
**PLAN**



**FRONT ELEVATION**

**SIDE ELEVATION**

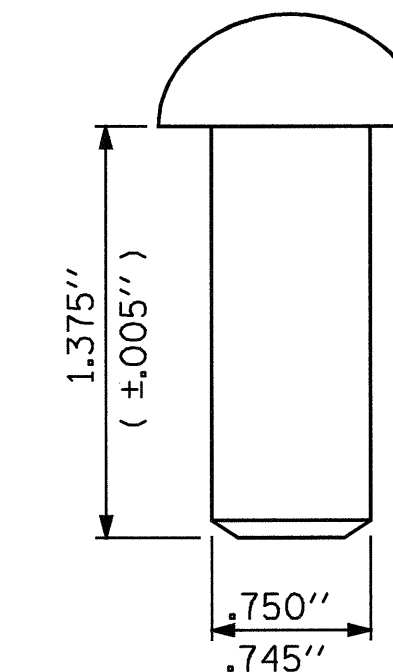
**DETAILS OF POST**



**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**

ASSEMBLED BY : MIKE BRITT	DATE : 2-8-06
CHECKED BY : A.K. PATEL	DATE : 3-7-06
DRAWN BY : EEM 6/94	REV. 8/16/99 RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00 LES/RDR
	REV. 5/7/03R RWW/JTE



NOTES

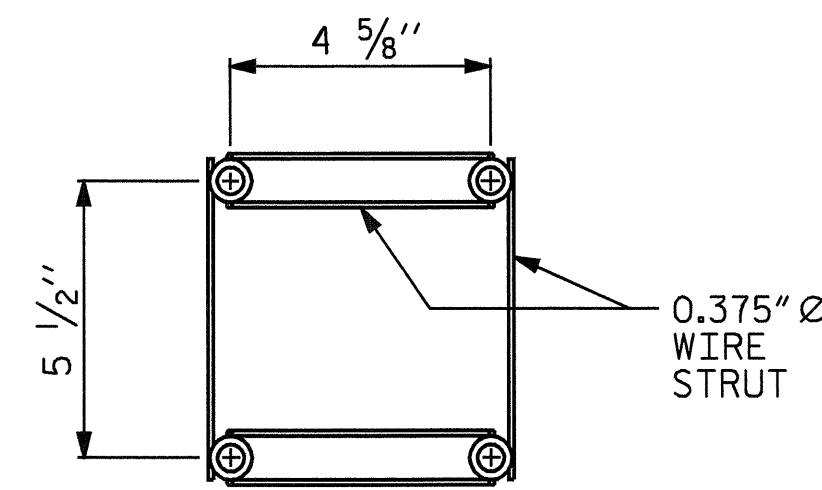
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

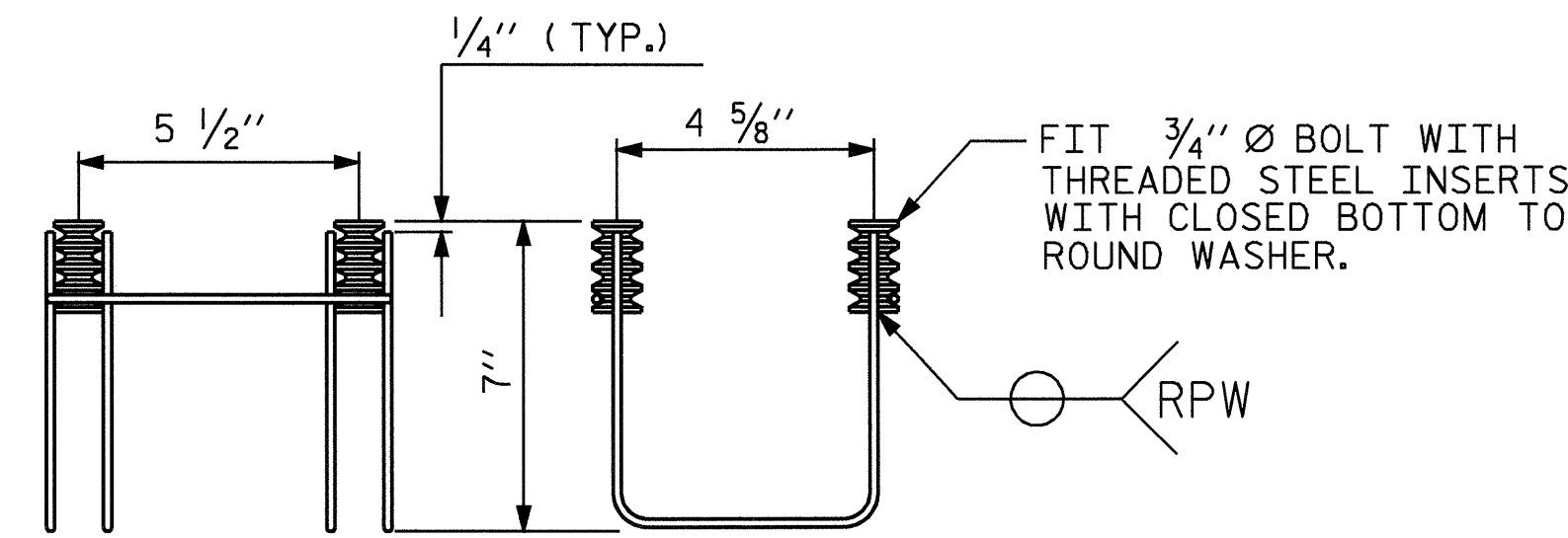
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN LIEU OF THE METAL RAIL ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



PLAN



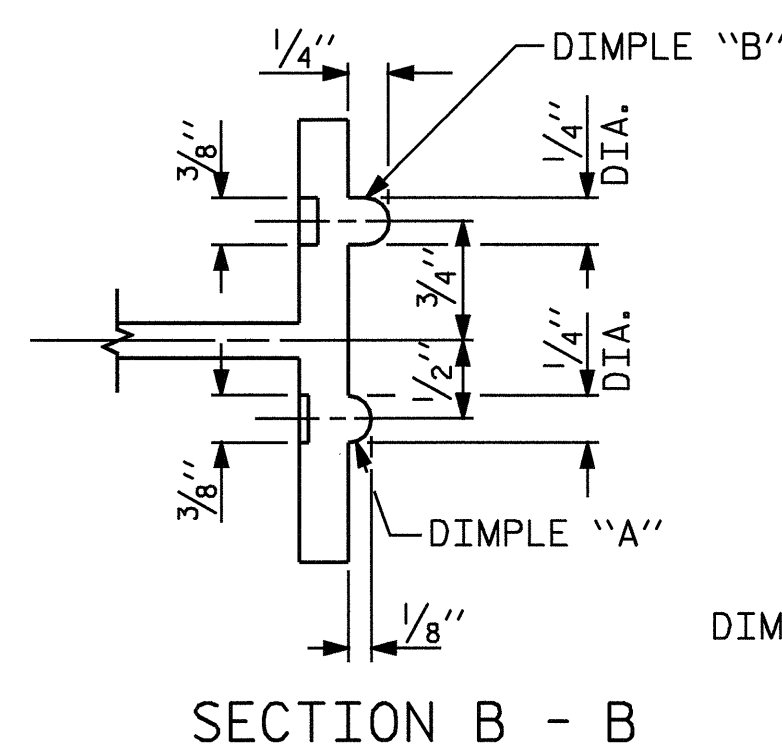
SIDE VIEW

ELEVATION

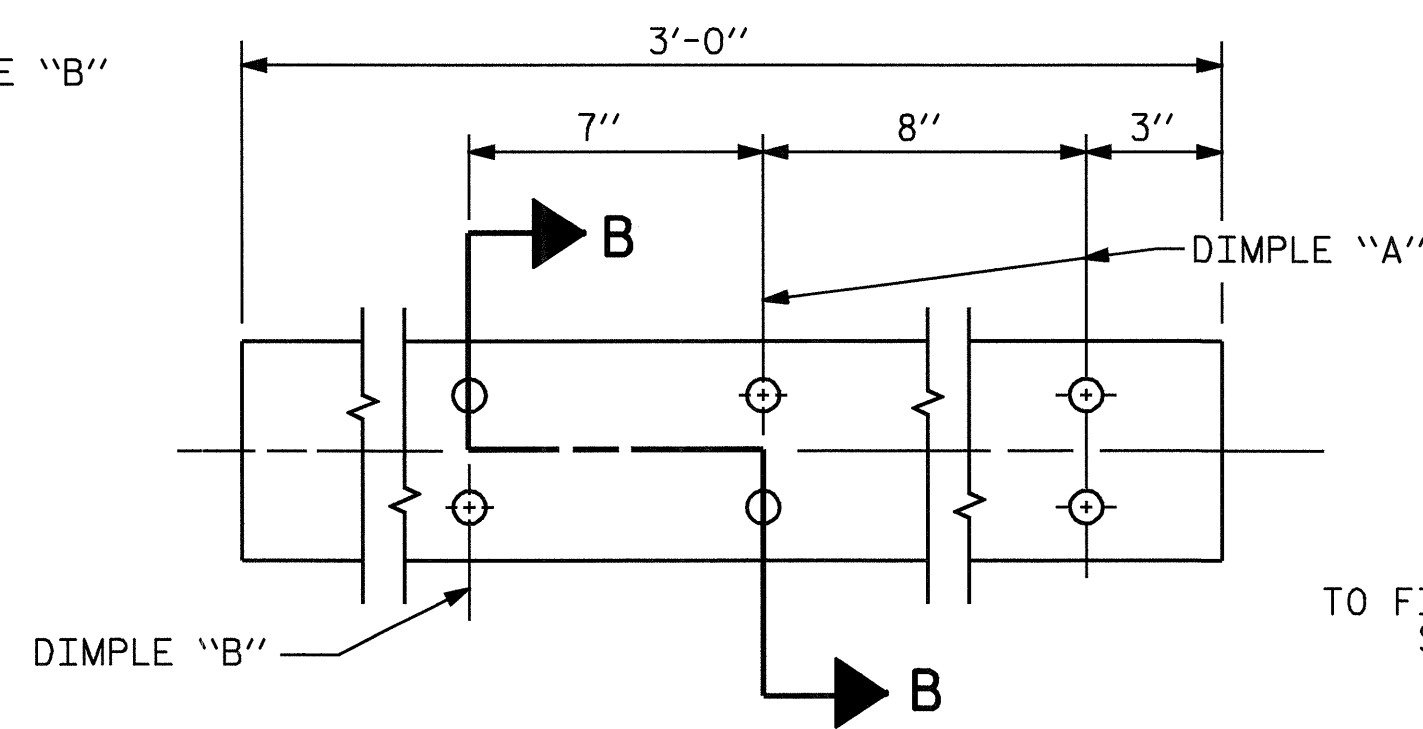
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

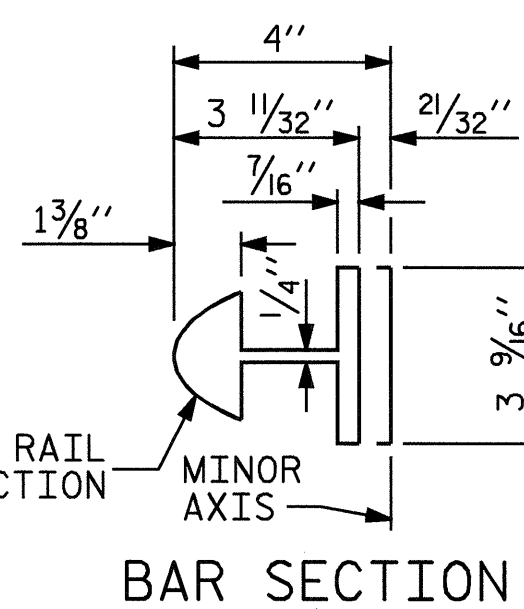
( 62 ASSEMBLIES REQUIRED )



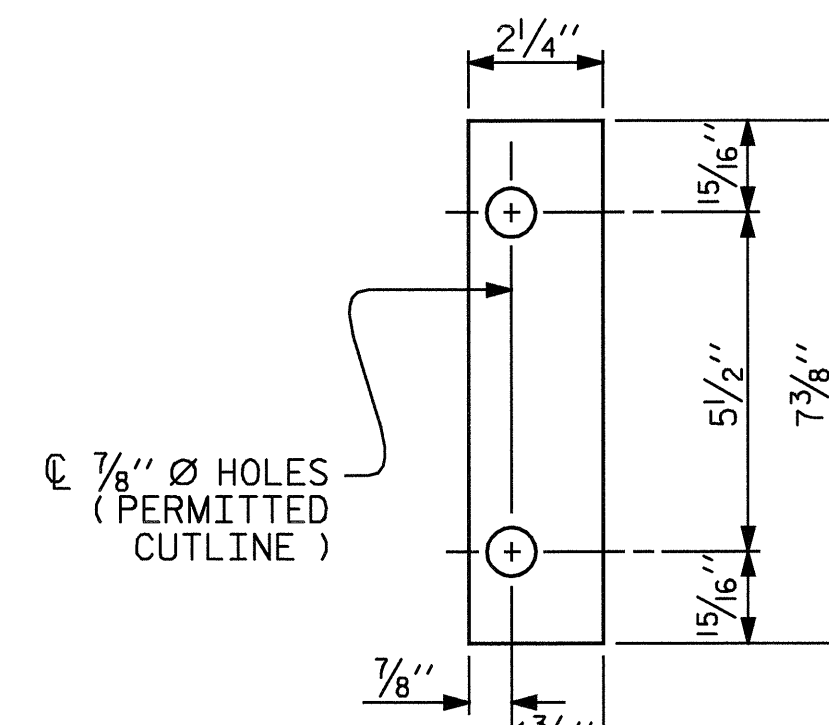
SECTION B - B



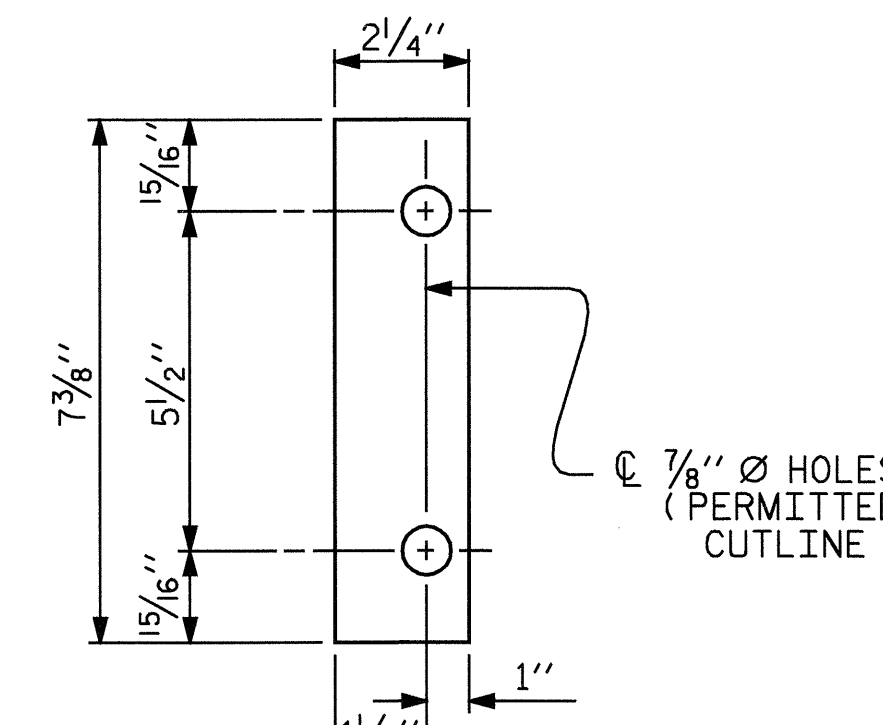
EXPANSION BAR DETAILS



BAR SECTION



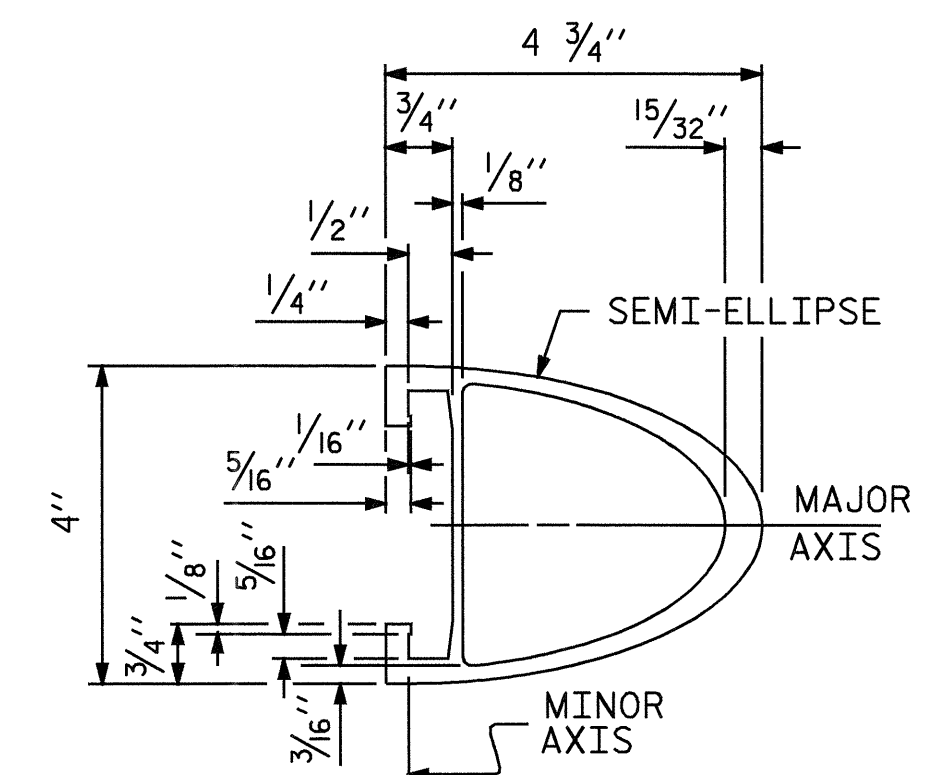
FRONT PLATE



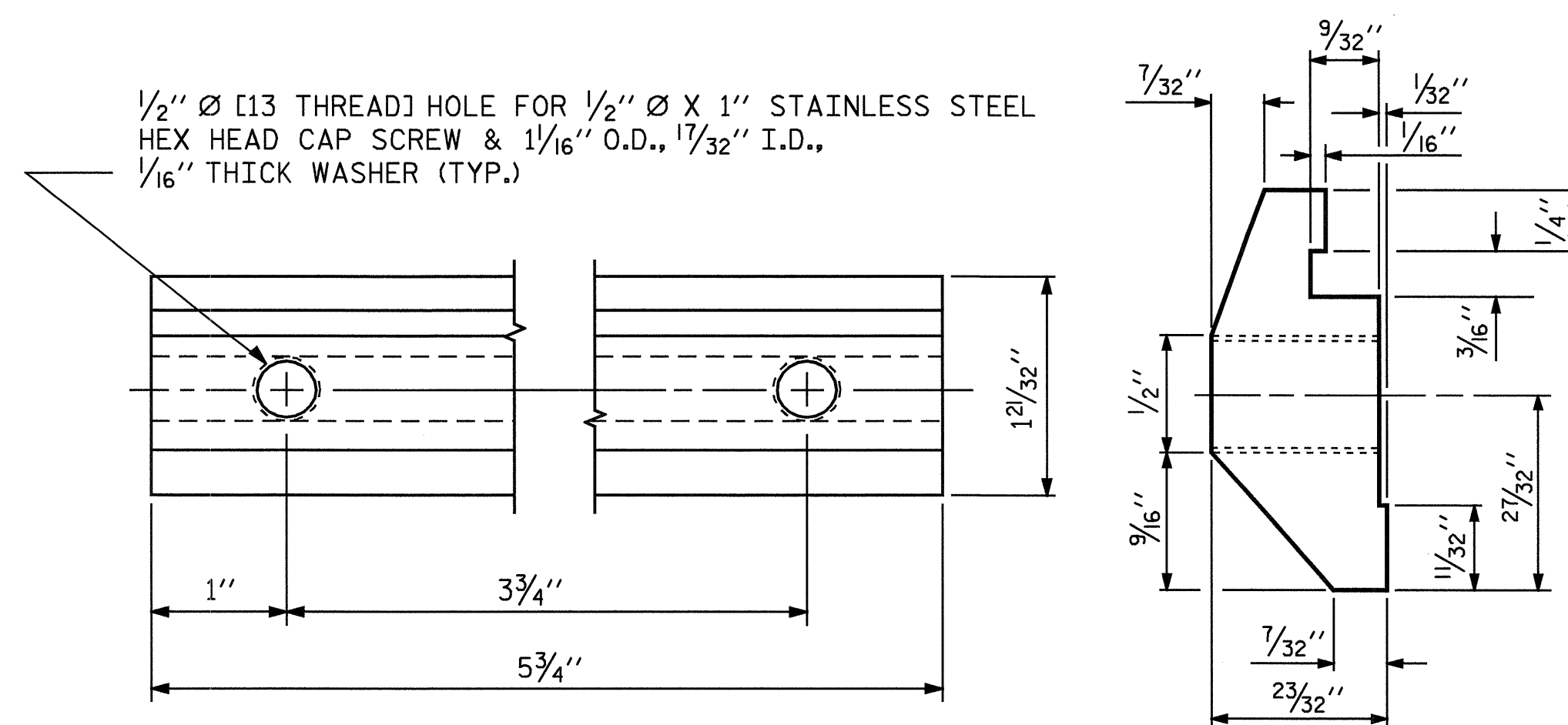
REAR PLATE

SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

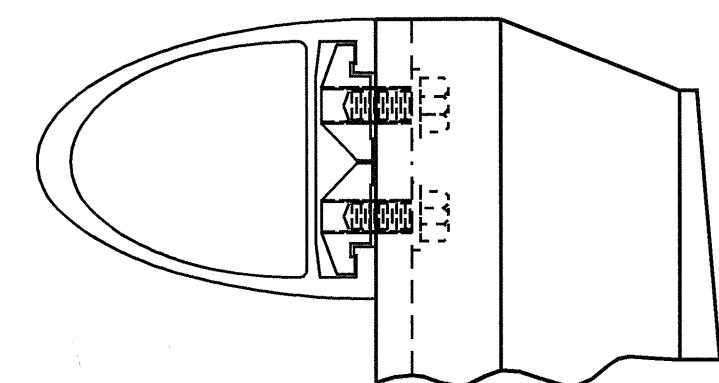


RAIL SECTION

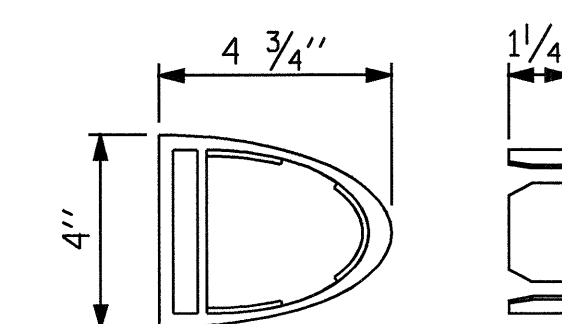


CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY



RAIL CAP



PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

ASSEMBLED BY : MIKE BRITT	DATE : 2-8-06
CHECKED BY : A.K. PATEL	DATE : 3-7-06
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/7/03 RWW/JTE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 36
2			4			

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
- B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

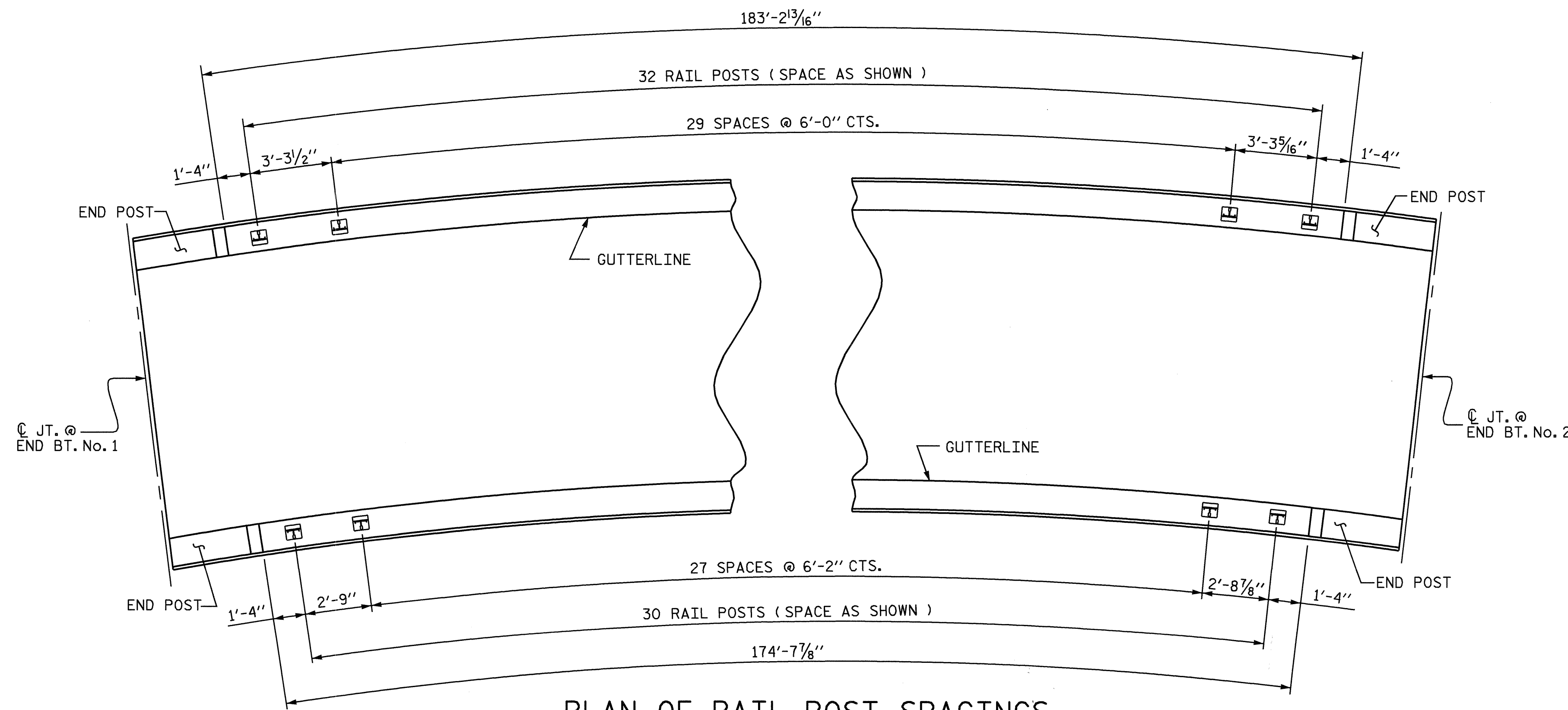
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

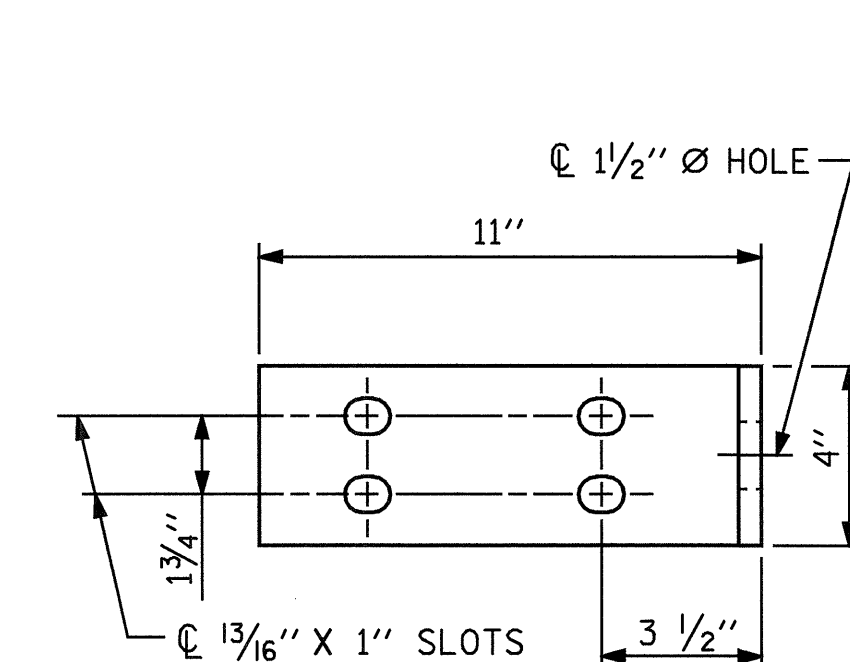
THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

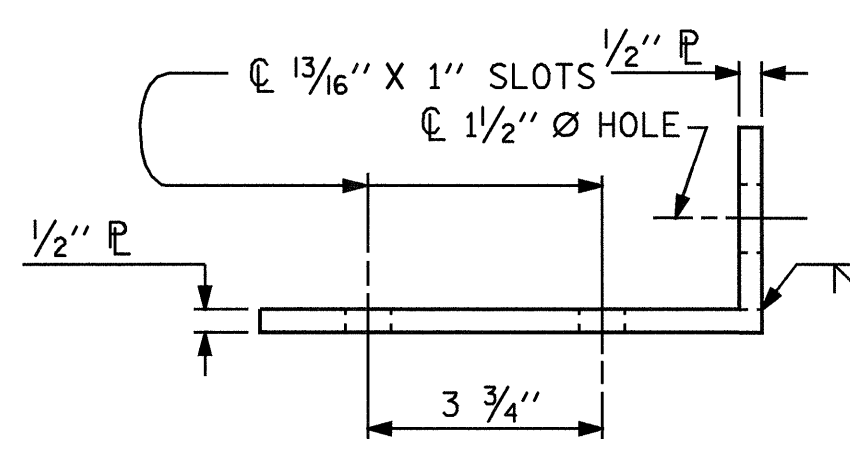


PLAN OF RAIL POST SPACINGS

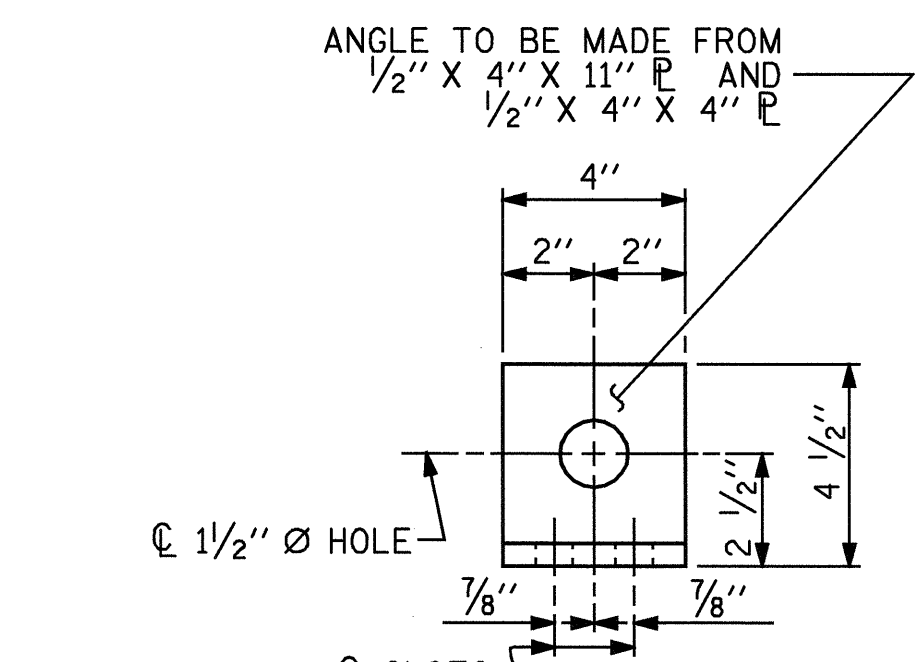
ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET



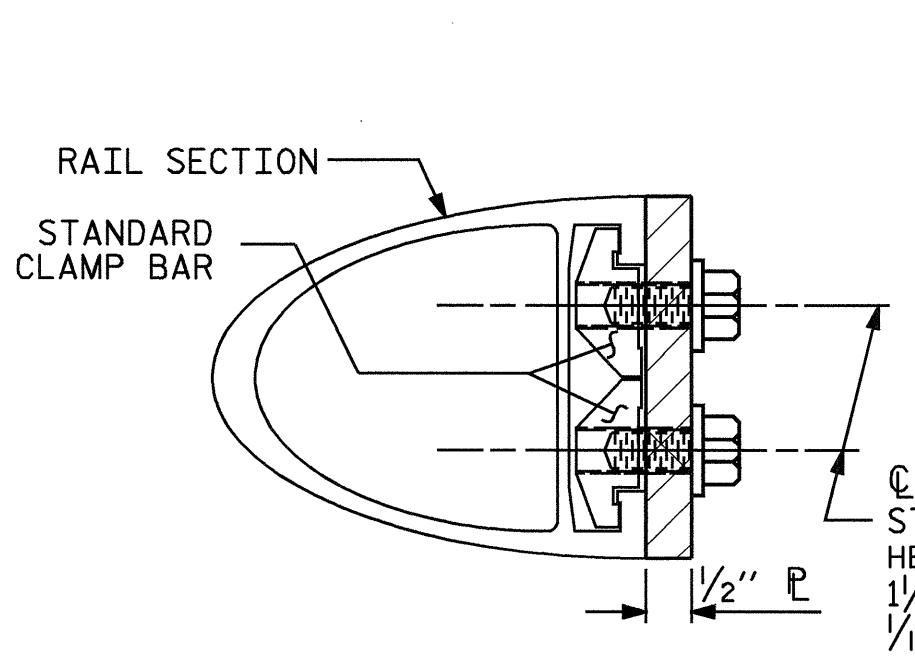
ELEVATION



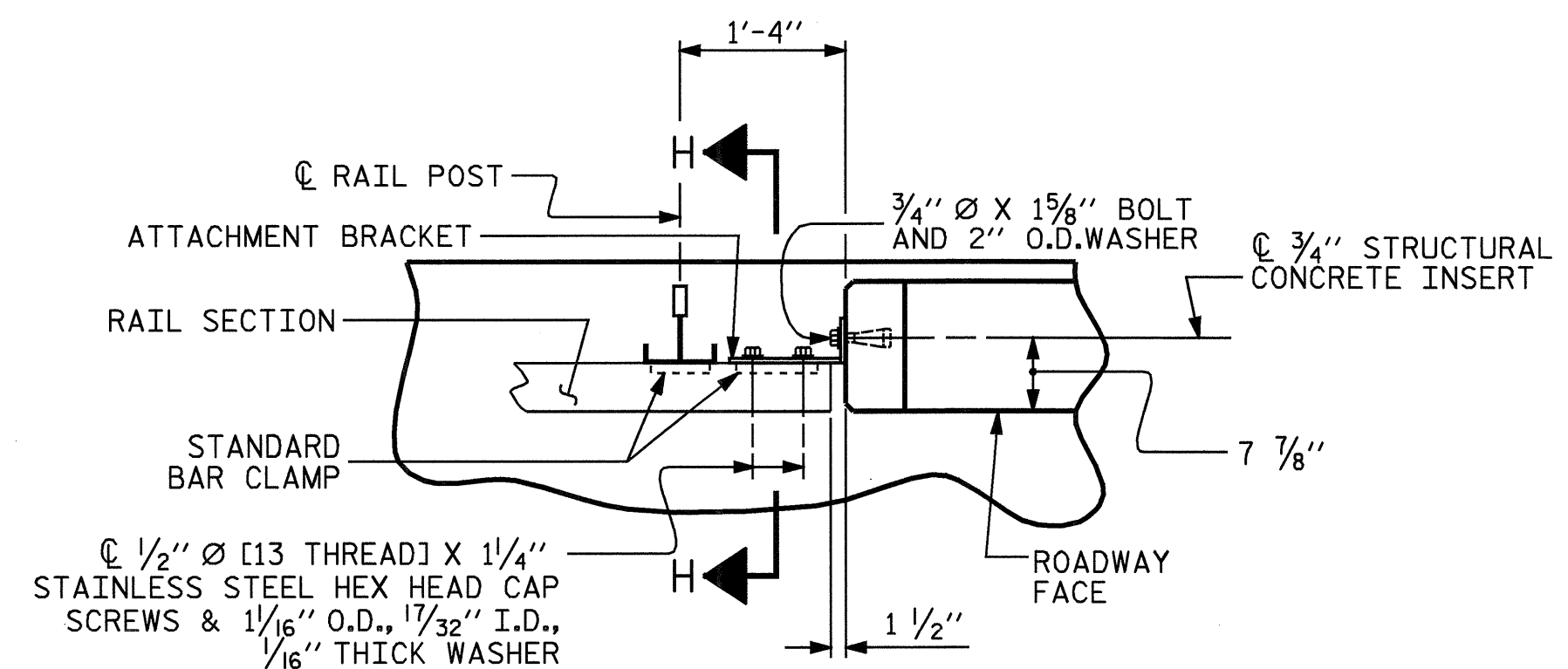
TOP VIEW



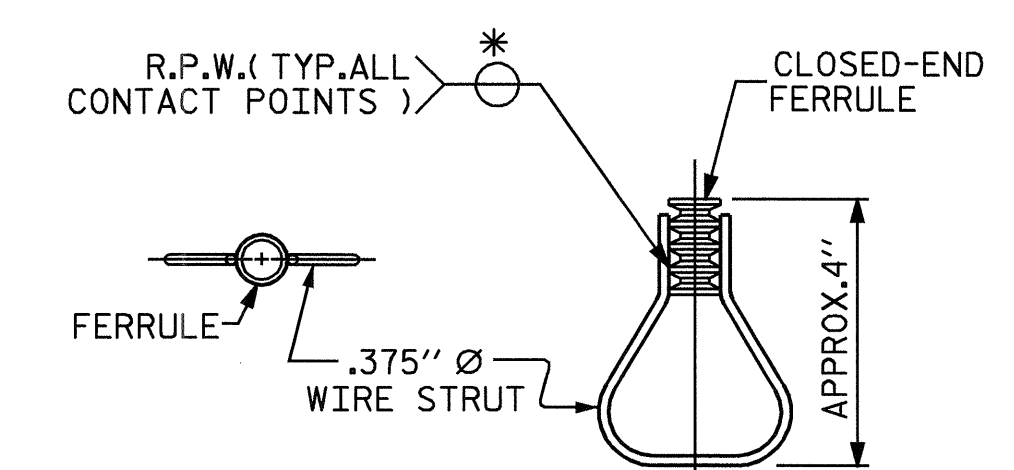
END VIEW



SECTION H-H



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS

ASSEMBLED BY : MIKE BRITT	DATE : 2-10-06
CHECKED BY : A.K. PATEL	DATE : 3-7-06
DRAWN BY : FCJ 1/88	REV. 8/16/99 RWW/LES
CHECKED BY : CRK 3/89	REV. 10/17/00 LES/RDR
	REV. 5/7/03 RWW/JTE

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 36

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

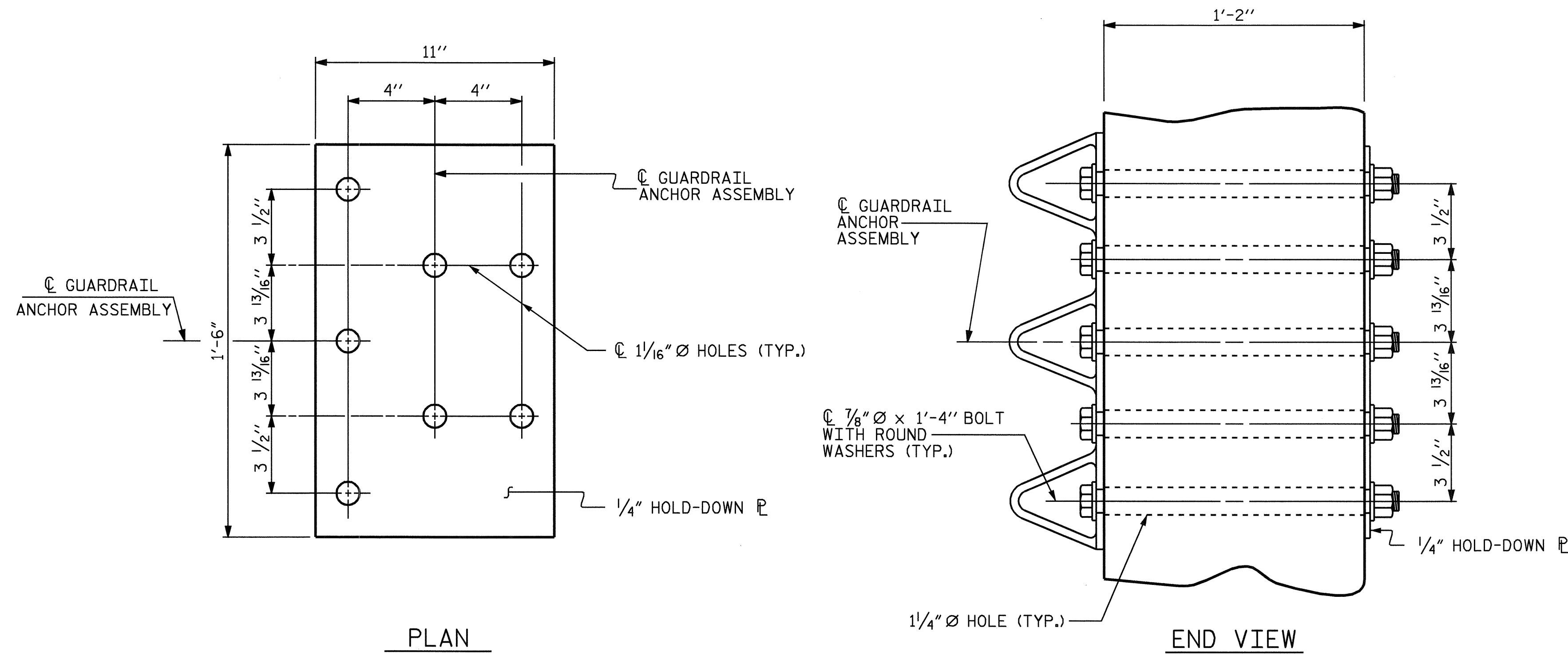
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

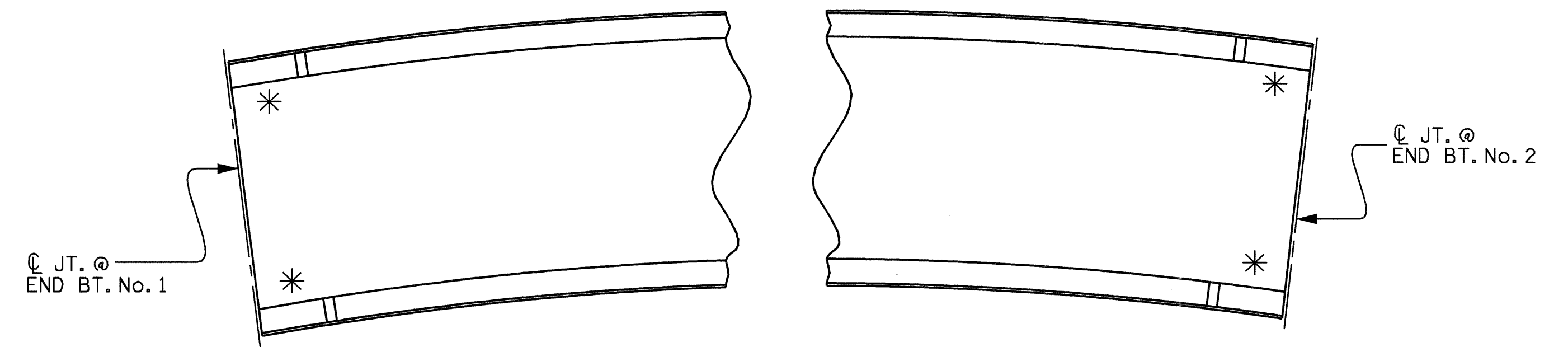
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

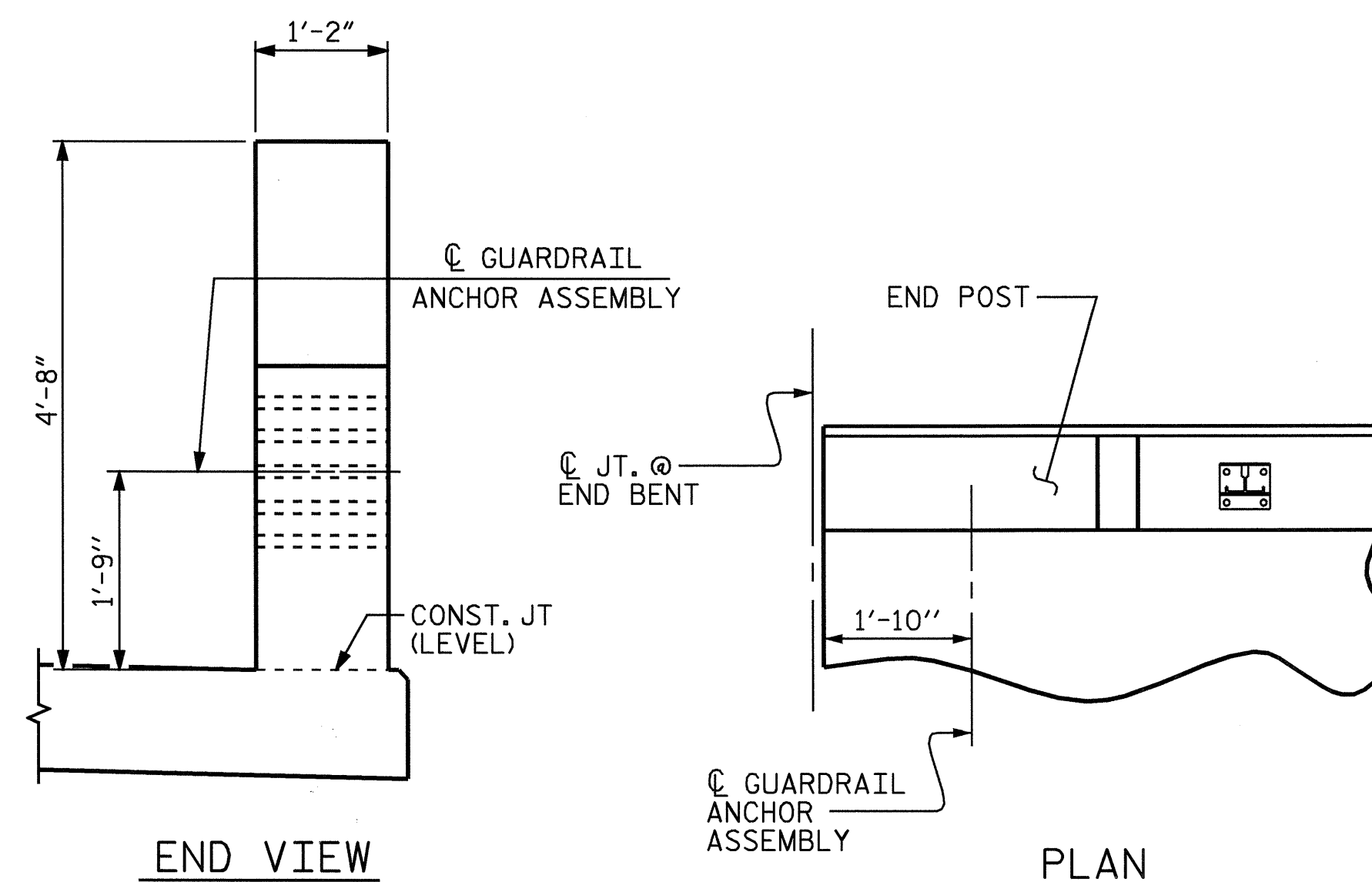
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

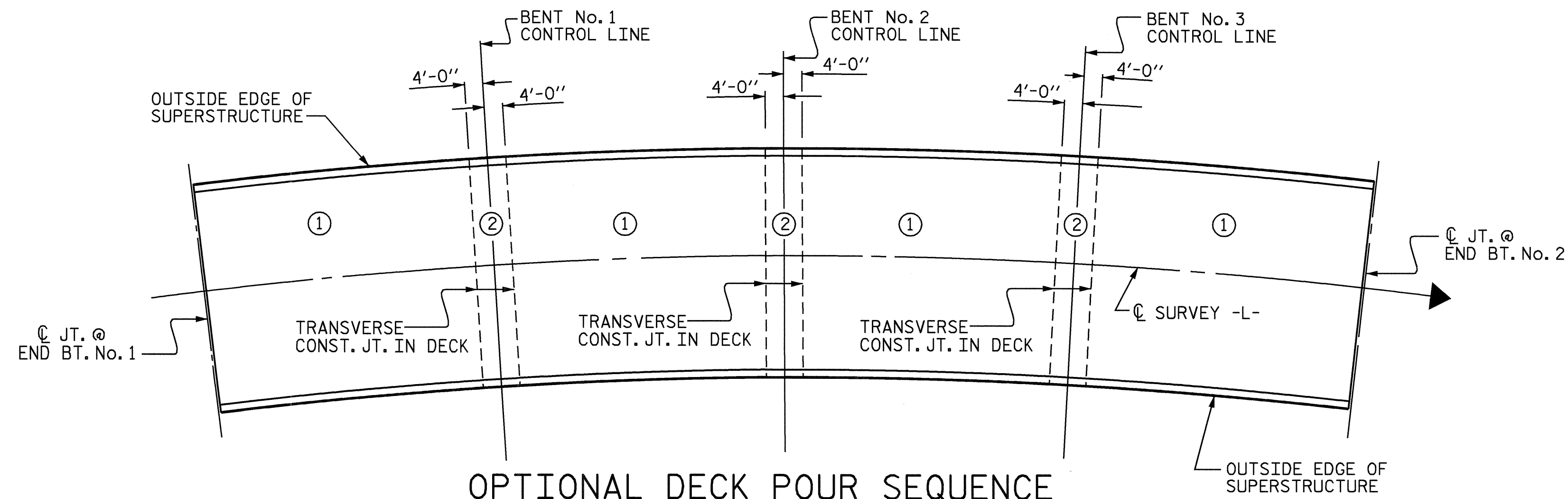
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS



ASSEMBLED BY : MIKE BRITT	DATE : 2-10-06
CHECKED BY : A.K. PATEL	DATE : 3-7-06
DRAWN BY : EEM 6/94	REV. 8/16/99 RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00 RWW/LES
	REV. 5/7/03 RWW/JTE

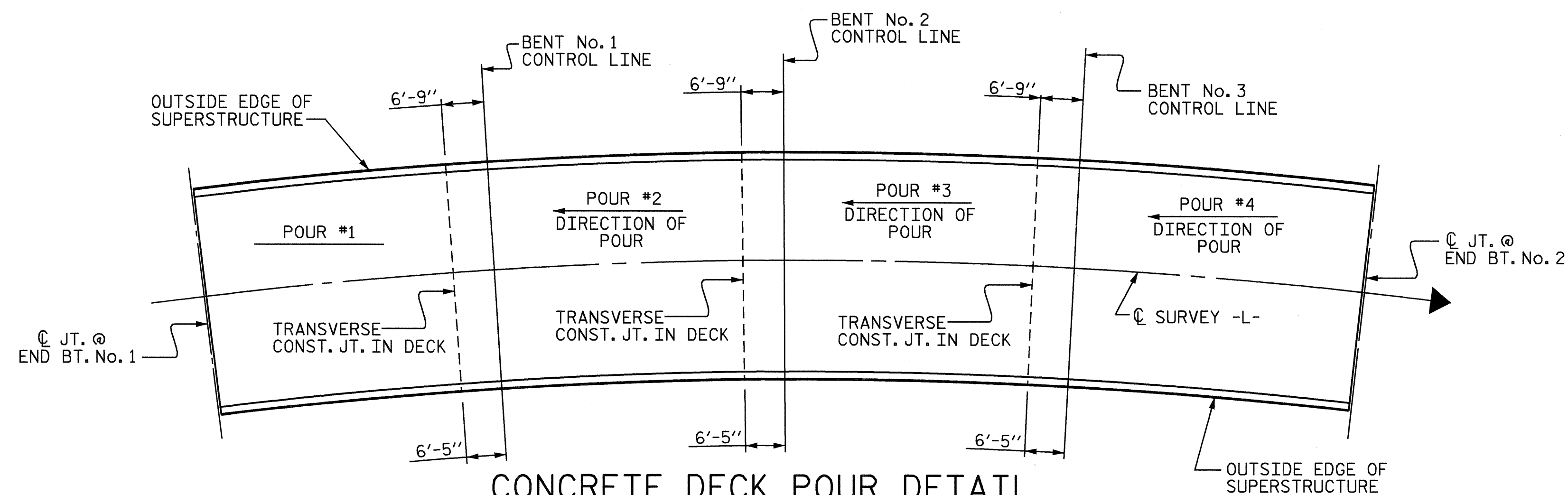
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			36





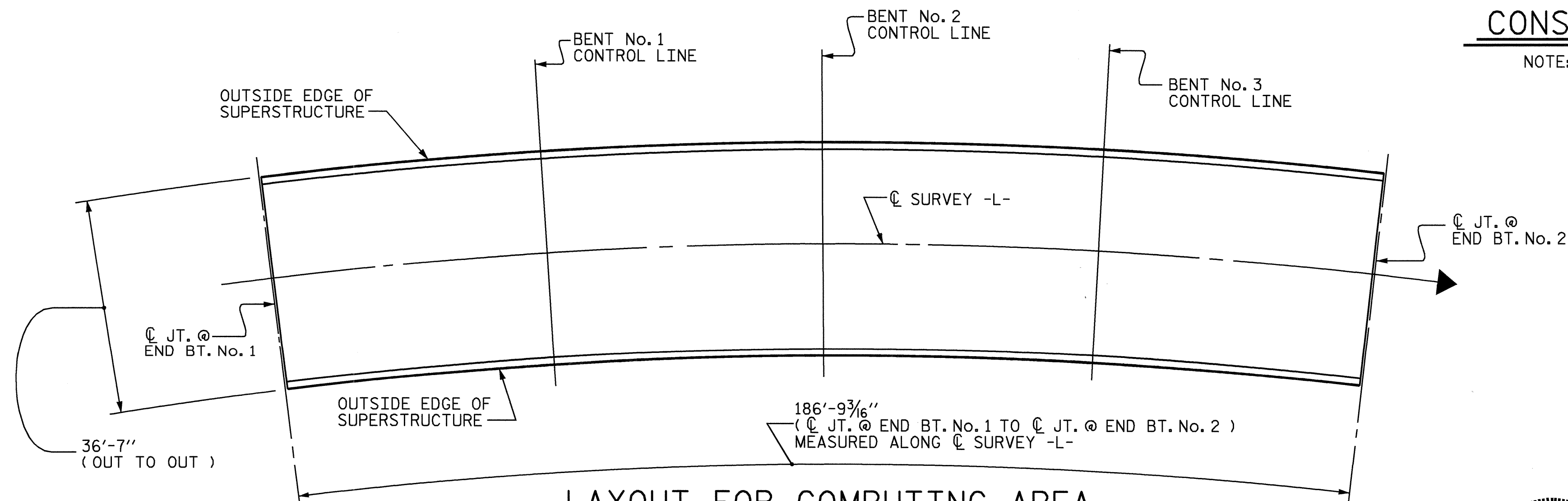
**OPTIONAL DECK POUR SEQUENCE**

POUR ② CANNOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.



**CONCRETE DECK POUR DETAIL**

NOTE: ALL DIMENSIONS ARE MEASURED ALONG THE ARC OF OUTSIDE EDGE OF SUPERSTRUCTURE



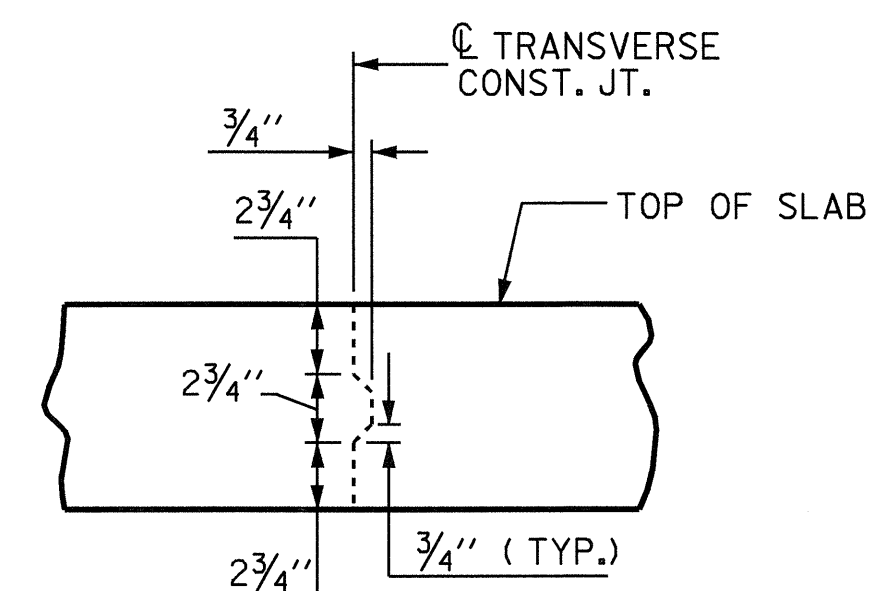
**LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB**  
(SQ. FT. = 6,824)

**BILL OF MATERIAL**

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	327	#5	STR.	36'-3"	12363
A2	327	#5	STR.	36'-3"	12363
* B1	46	#4	STR.	29'-10"	917
* B2	46	#4	STR.	12'-8"	389
* B3	69	#7	STR.	39'-0"	5500
* B4	66	#7	STR.	14'-6"	1956
* B5	7	#4	STR.	28'-11"	135
* B6	7	#4	STR.	27'-8"	129
B7	16	#5	STR.	49'-3"	822
B8	72	#5	STR.	49'-1"	3686
B9	72	#5	STR.	48'-2"	3617
B10	16	#5	STR.	47'-3"	789
* K1	8	#8	1	11'-6"	246
* K2	12	#8	2	17'-10"	571
K3	48	#4	STR.	6'-10"	219
K4	24	#4	STR.	4'-8"	75
K5	18	#4	STR.	16'-2"	194
* S1	48	#5	3	5'-1"	254
S2	144	#4	5	2'-9"	265
* U1	24	#4	4	9'-6"	152
* U2	60	#4	4	11'-6"	461
REINFORCING STEEL					22,030 LBS.
* EPOXY COATED REINFORCING STEEL					23,073 LBS.

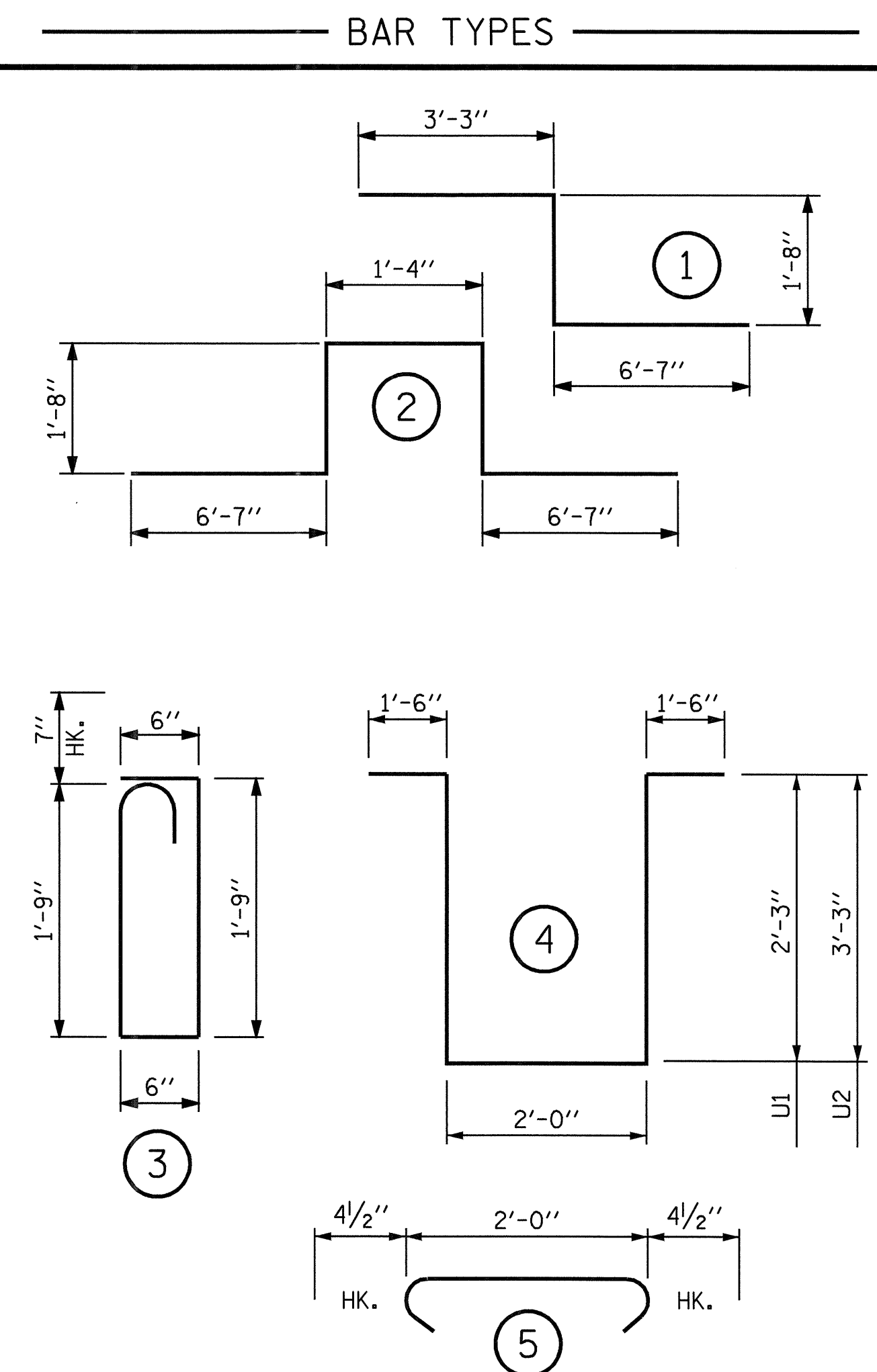
**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1,480 SQ.FT.
BRIDGE DECK	5,741 SQ.FT.
TOTAL	7,221 SQ.FT.



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.



ALL BAR DIMENSIONS ARE OUT TO OUT

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	44.5		
POUR #2	58.4		
POUR #3	58.4		
POUR #4	66.3		
TOTALS**	227.6	22,030	23,073

\*\*QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**STANDARD SUPERSTRUCTURE BILL OF MATERIAL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 36
2			4			

STD. NO. BOM2

ASSEMBLED BY : MIKE BRITT DATE : 2-15-06  
CHECKED BY : A.K. PATEL DATE : 3-6-06  
DRAWN BY : JMB 5/87 REV. 6/1/94 EEM/GRP  
CHECKED BY : SJD 9/87 REV. 8/16/99 RWW/LES



**NOTES**

★ FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

#5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

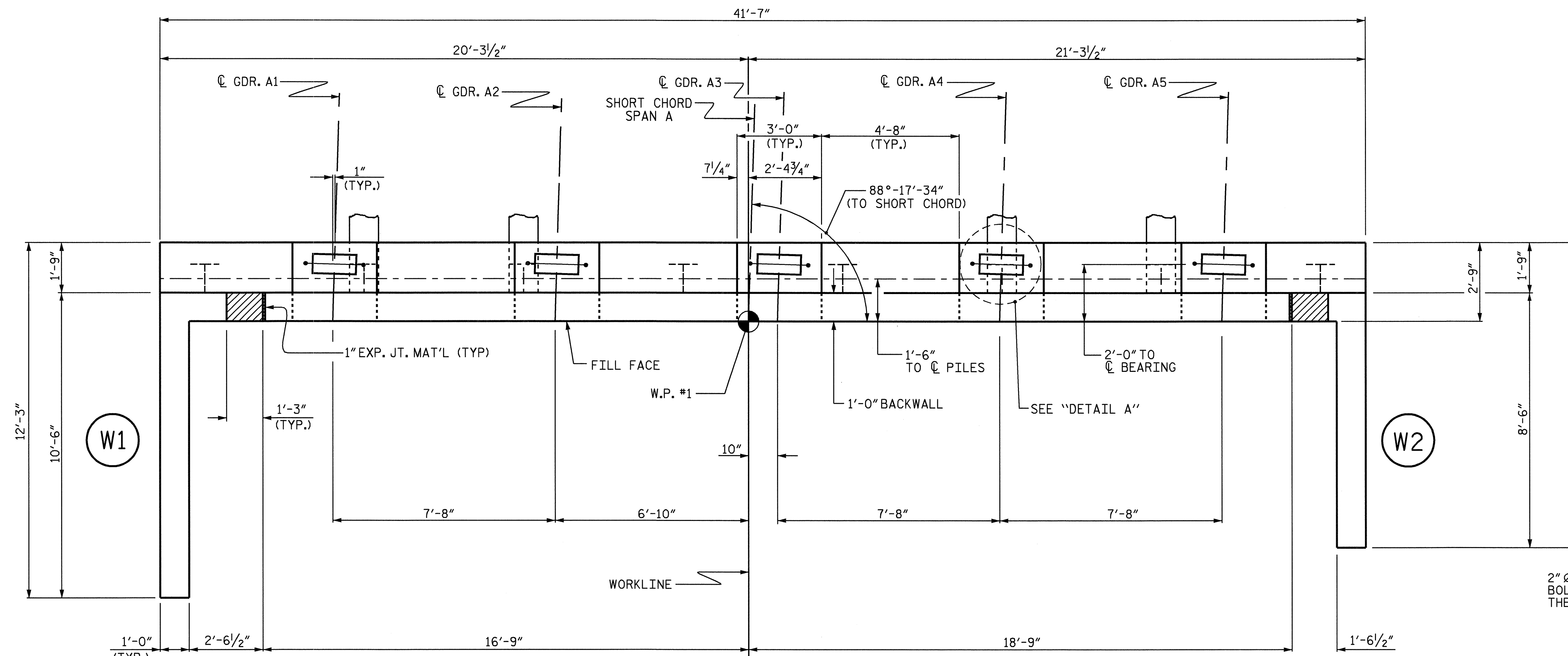
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

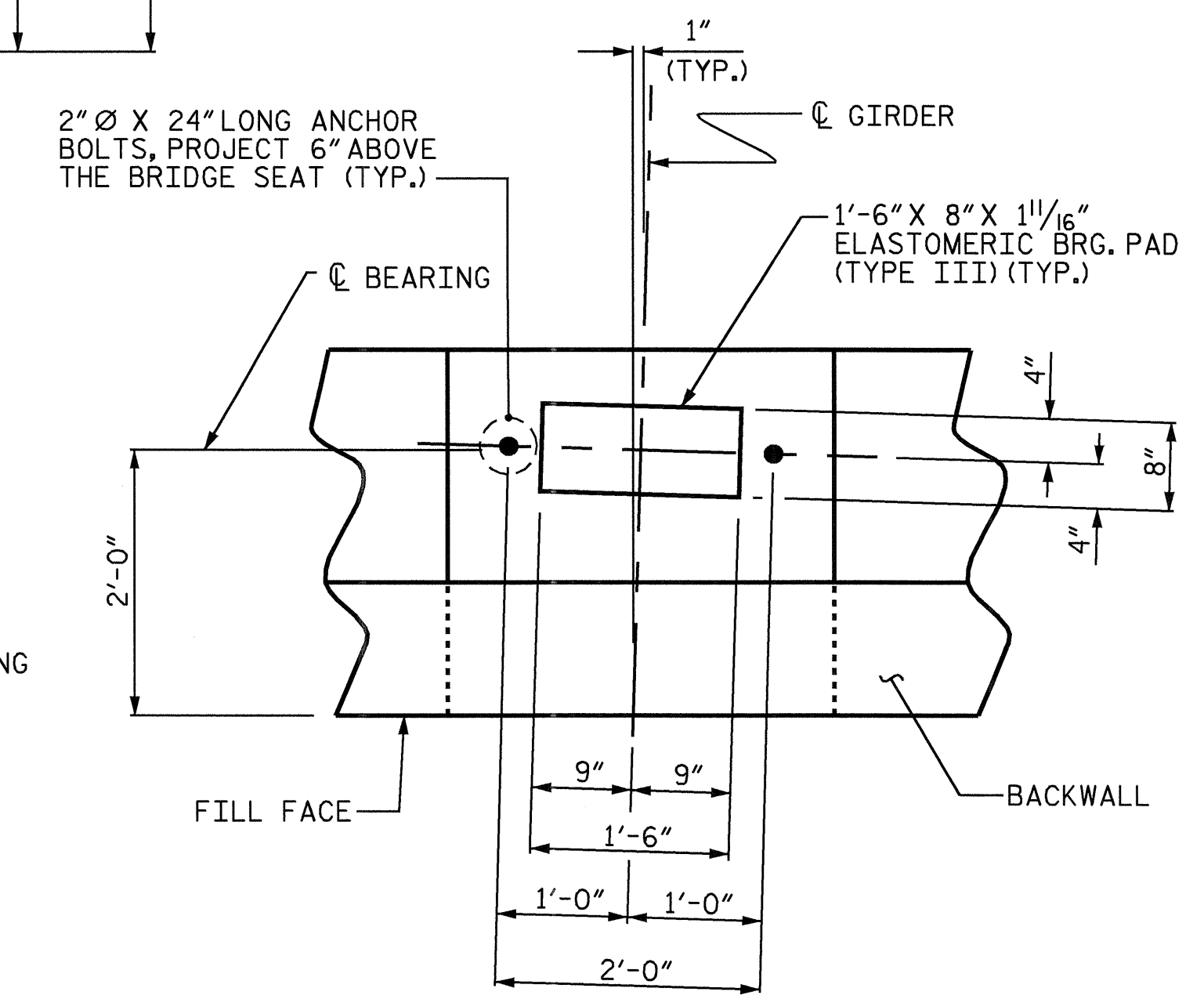
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT END BENT No. 1 FOR PILES NUMBER 4 THROUGH 8. SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT No. 1 FOR PILES NUMBER 1 THROUGH 3. EXCAVATE HOLES TO ELEVATION 280 FT. SEE PILE EXCAVATION SPECIAL PROVISION.

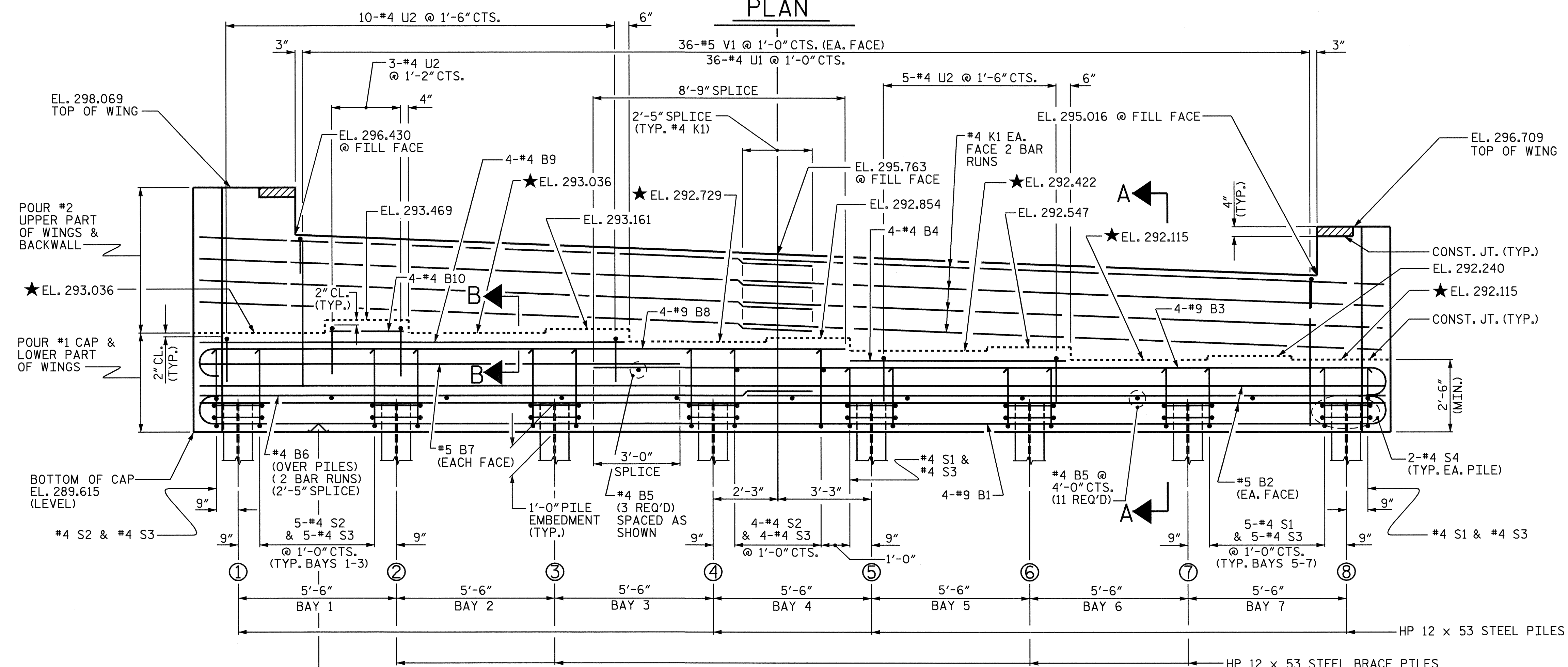


**PLAN**



**DETAIL "A"**

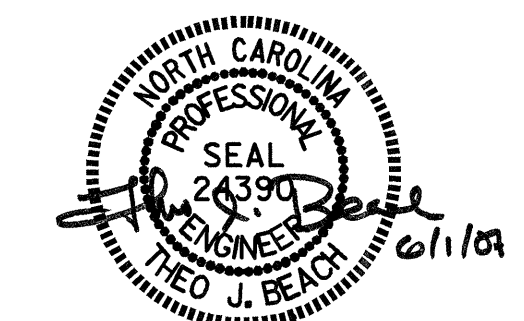
(TYP. EA. GIRDER)  
 PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-



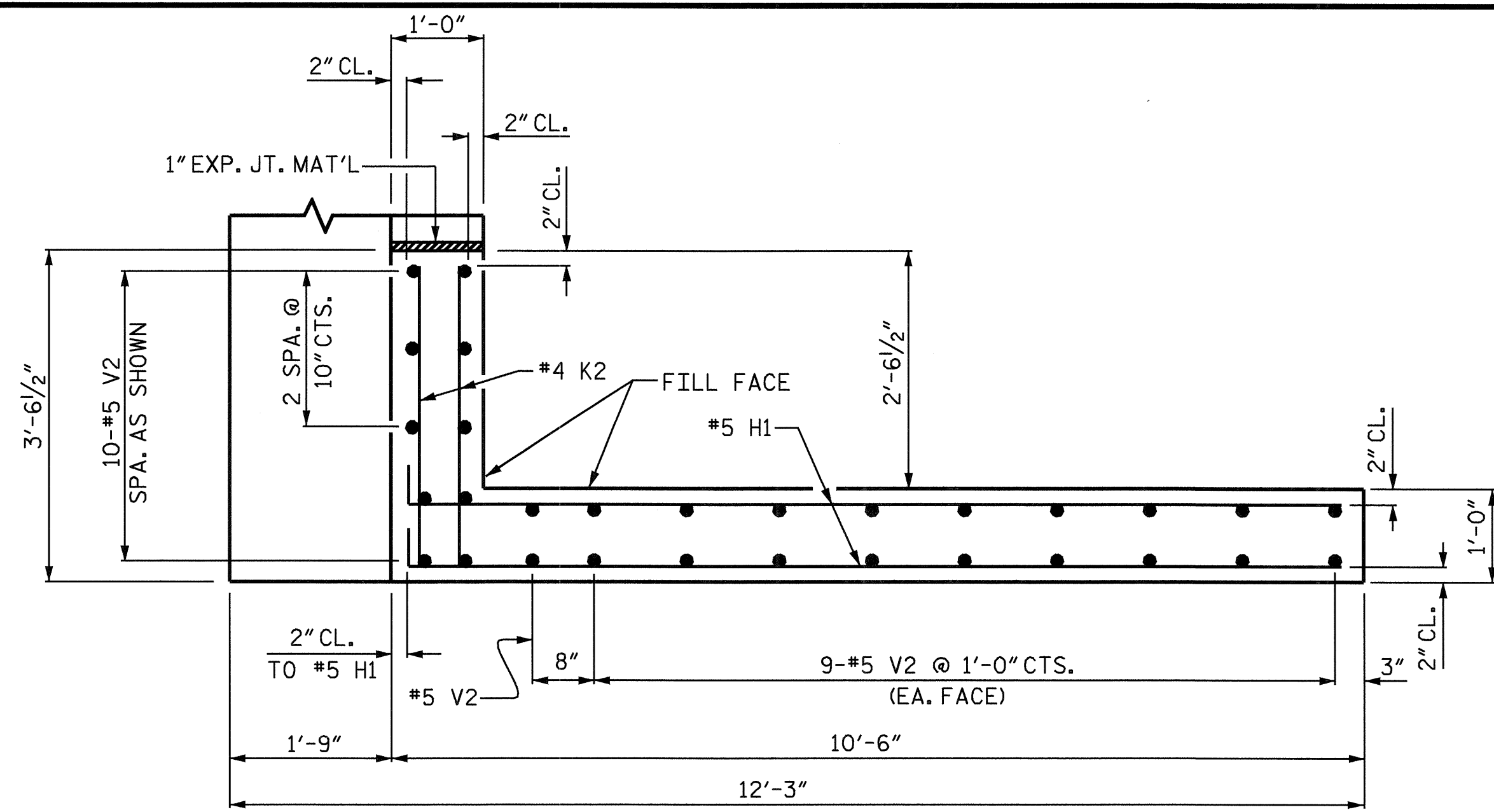
**ELEVATION**

DRAWN BY : S.B. WILLIAMS DATE : 1-06  
 CHECKED BY : A.K. PATEL DATE : 1-06

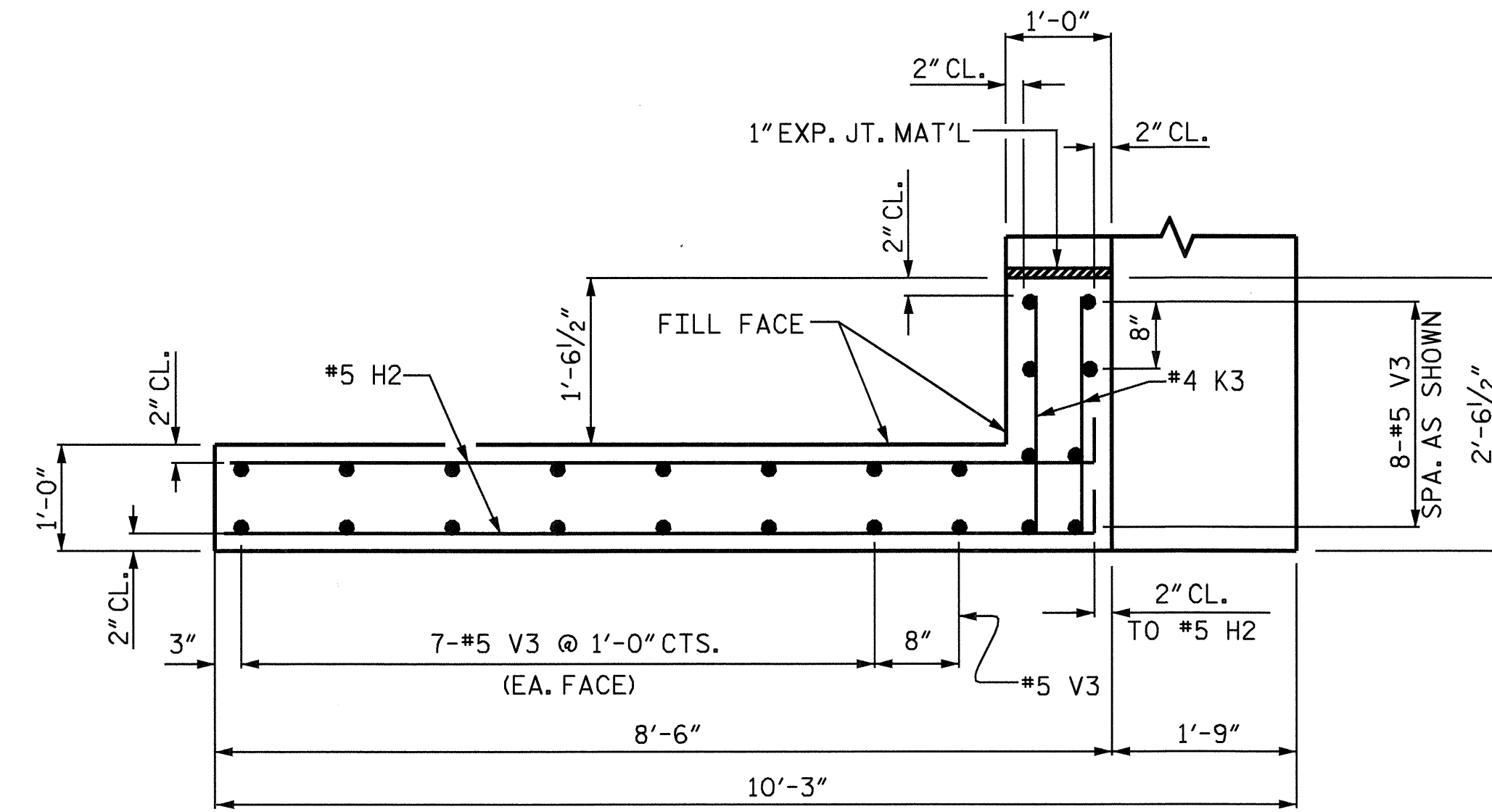
29-MAY-2007 12:37  
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 sbwilliams



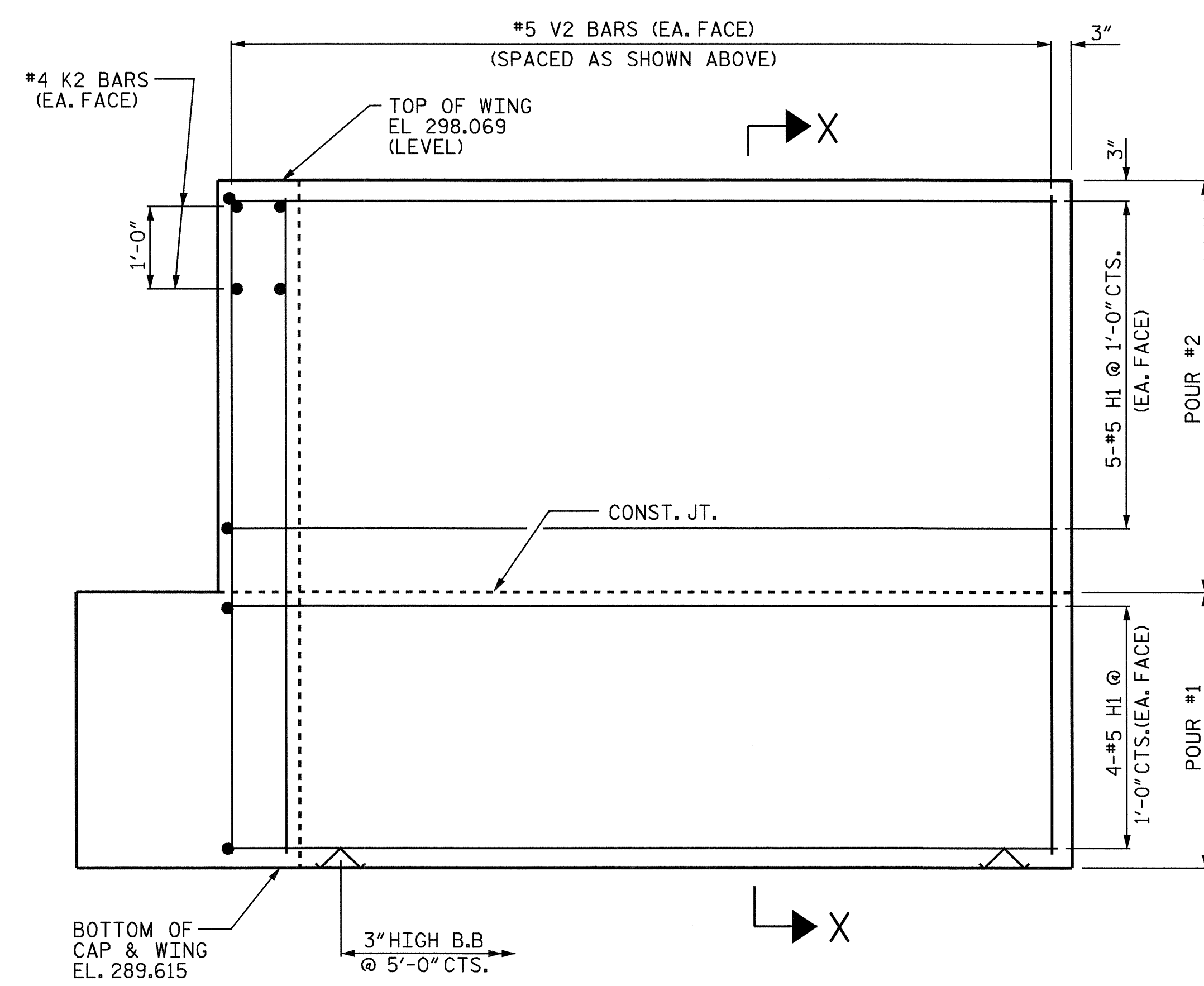
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT No. 1					
SHEET NO. S-22					
TOTAL SHEETS 36					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



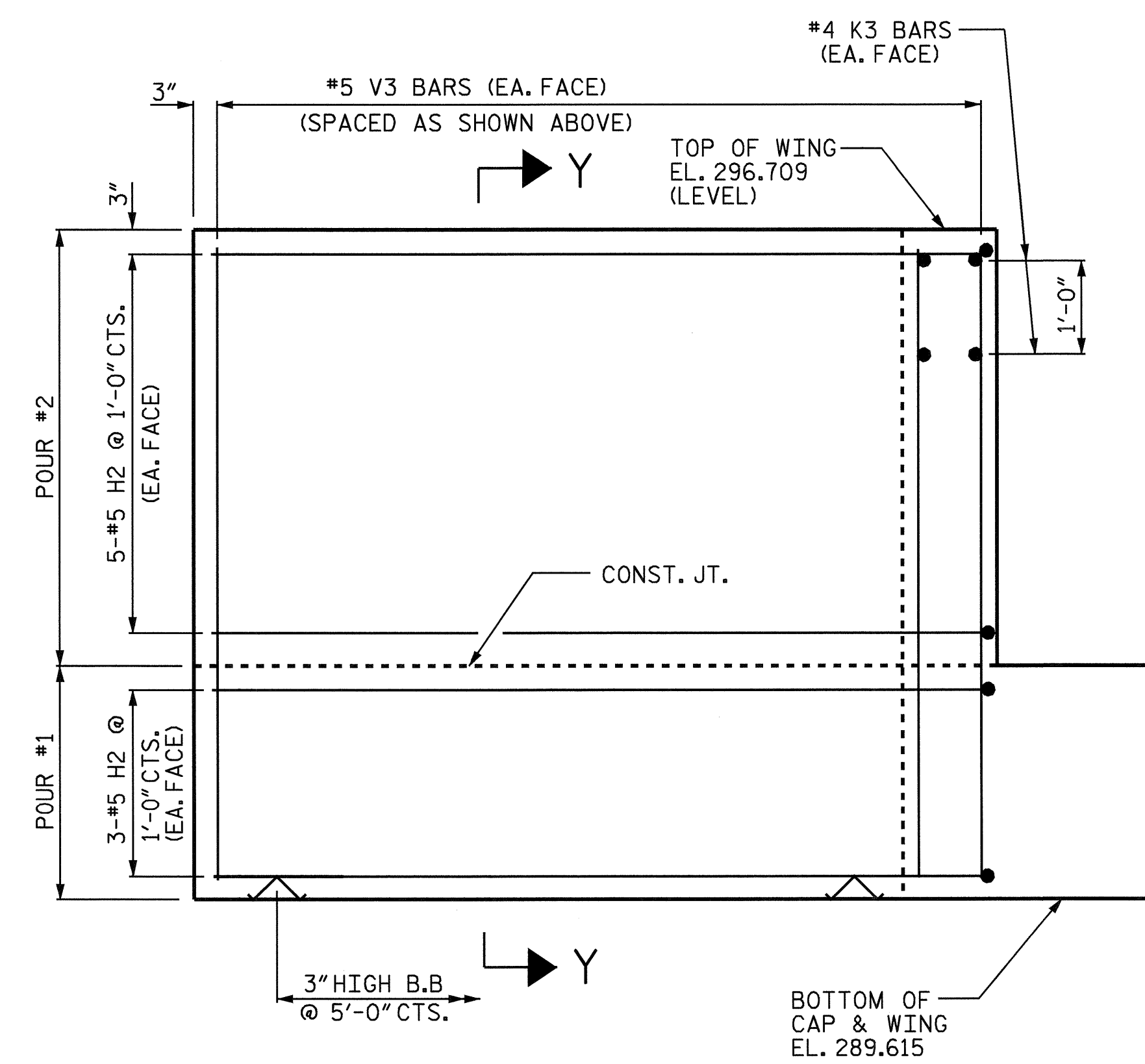
PLAN OF WING (W1)



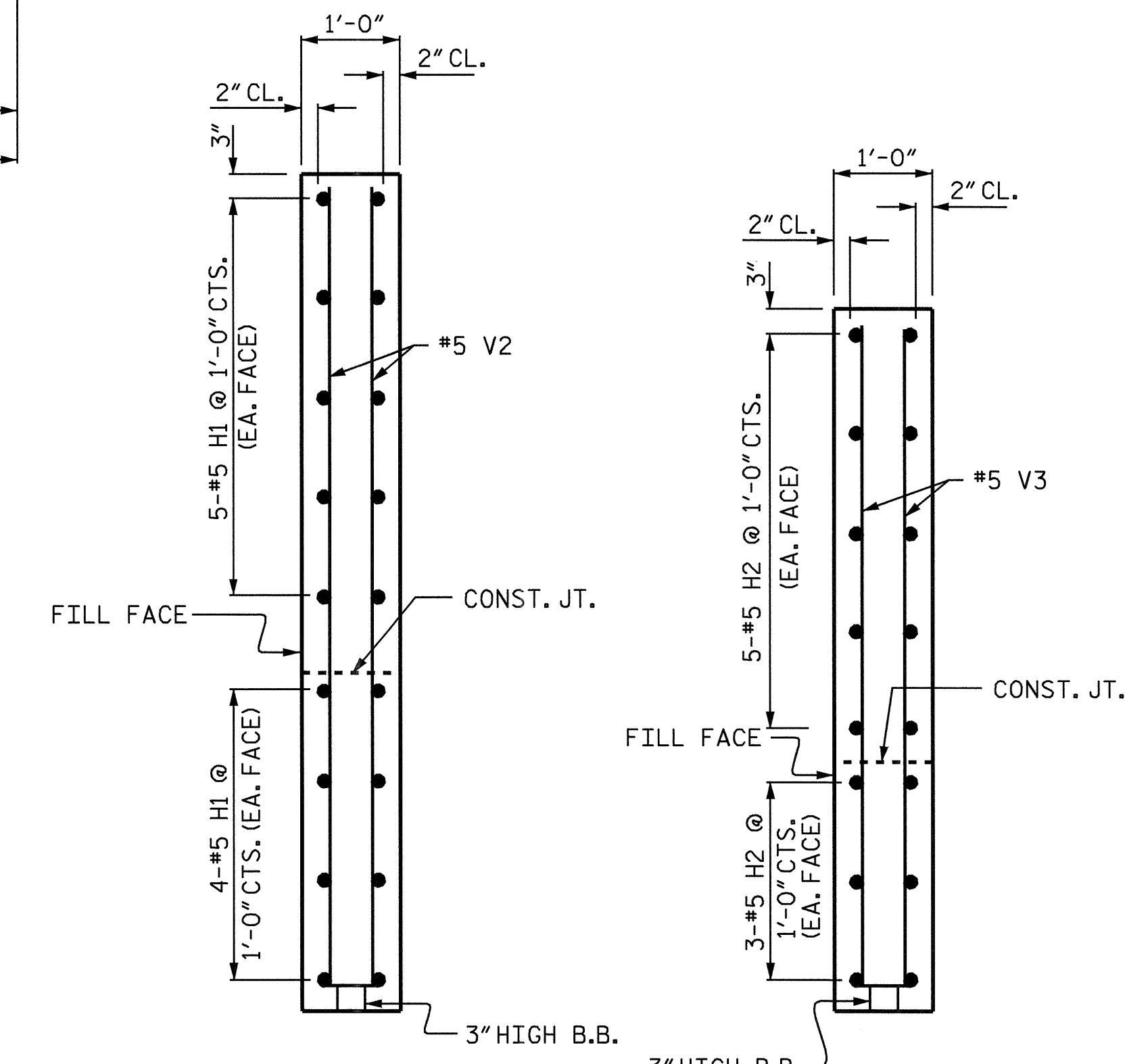
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

SECTION Y-Y

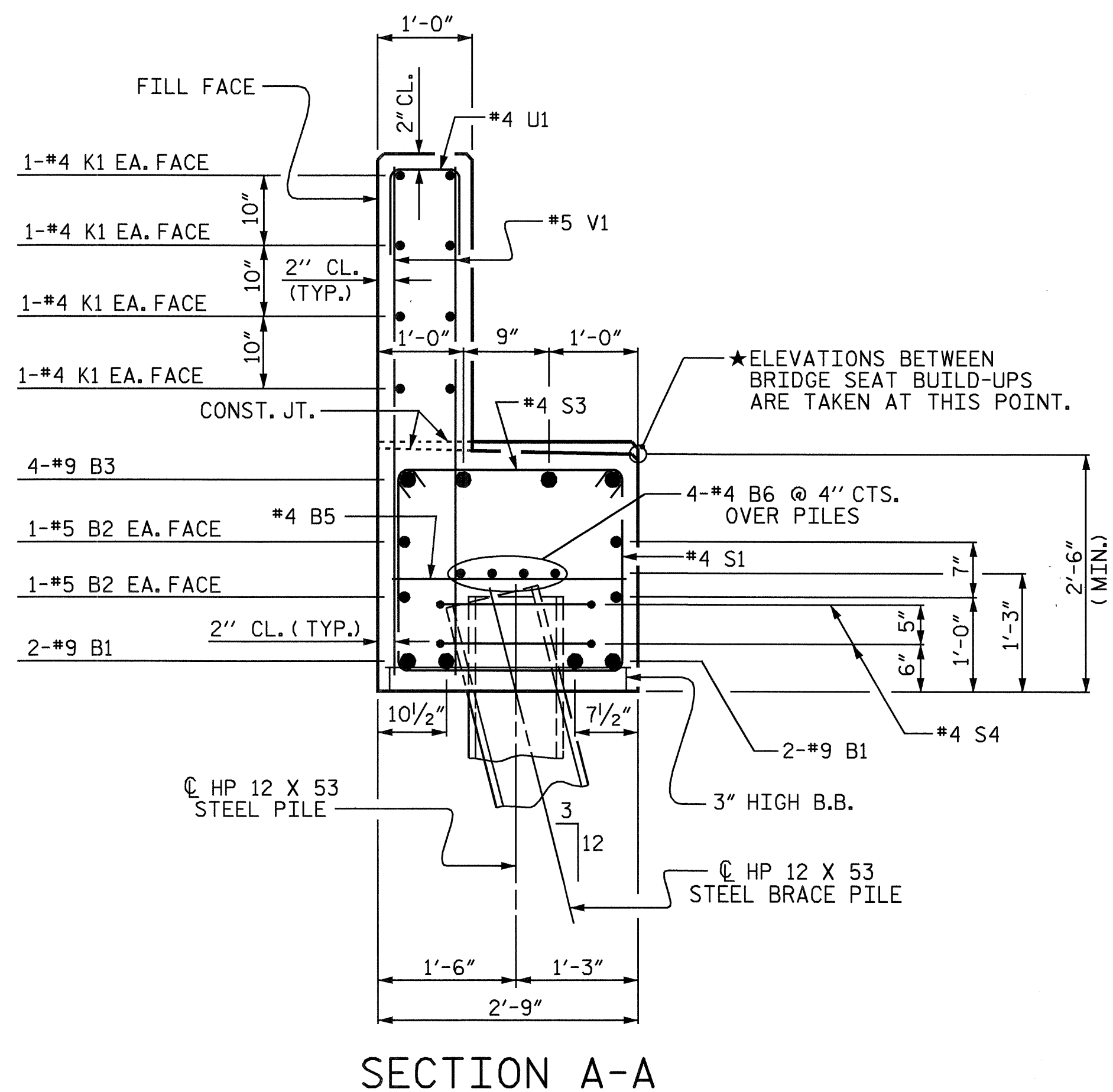
PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-23
TOTAL SHEETS					36

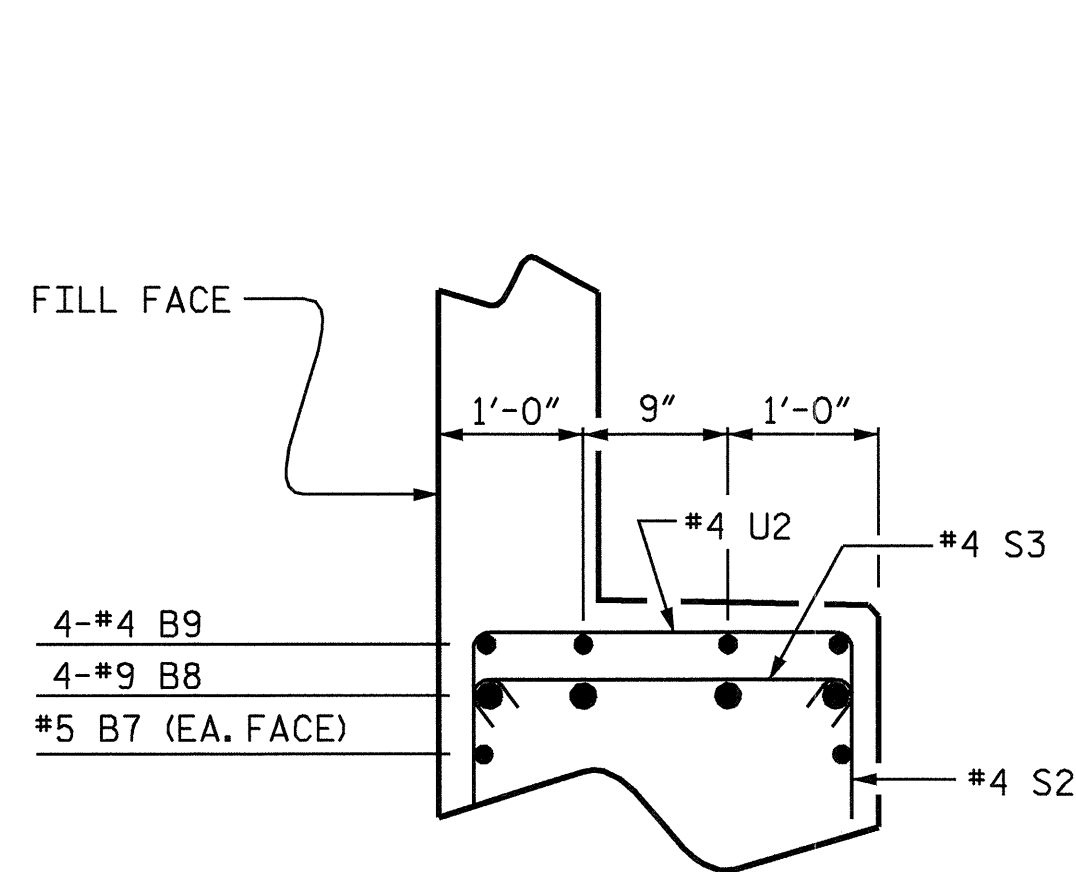


DRAWN BY: S.B. WILLIAMS DATE: 1-06  
 CHECKED BY: A.K. PATEL DATE: 1-06

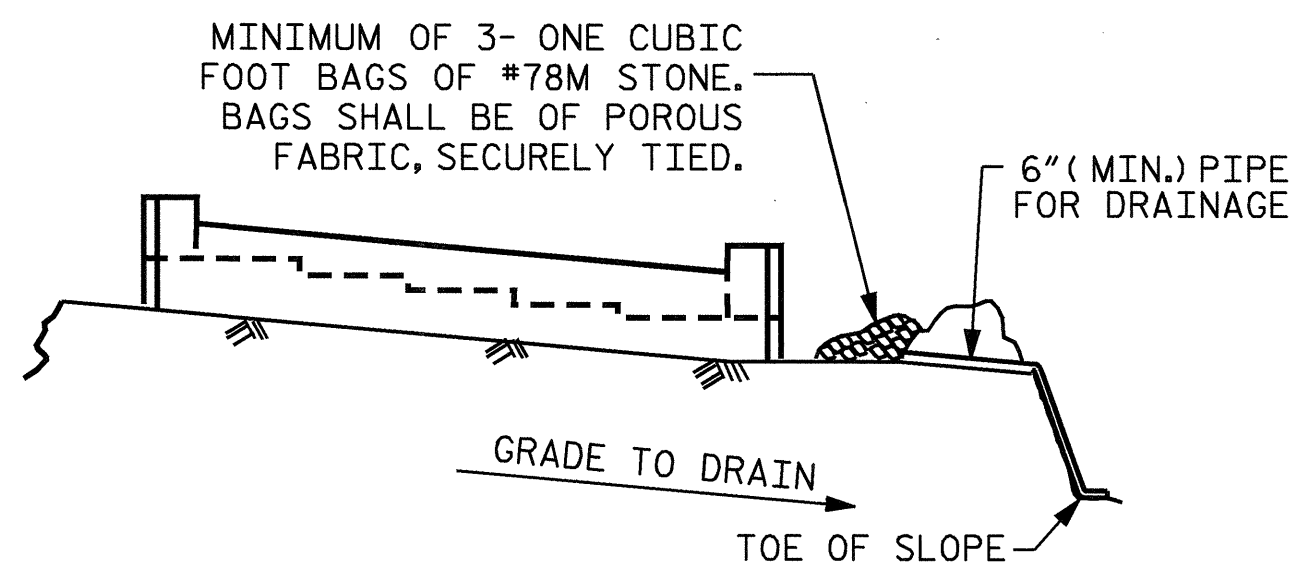




SECTION A-A



PARTIAL SECTION B-B



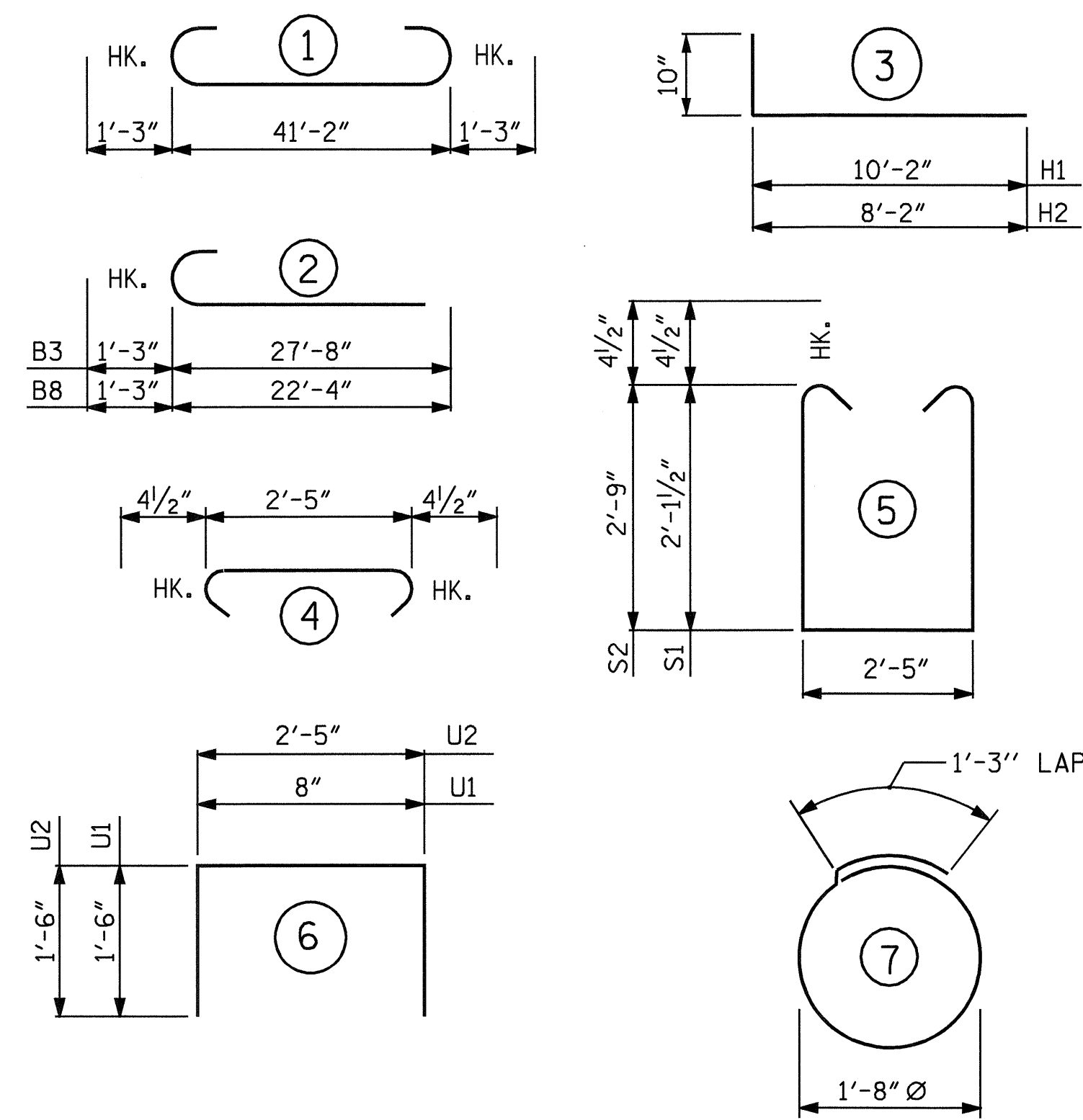
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9	1	43'-8"	594
B2	4	5	STR	41'-3"	172
B3	4	9	2	28'-11"	393
B4	4	4	STR	7'-6"	20
B5	14	4	STR	2'-5"	23
B6	8	4	STR	21'-10"	117
B7	2	5	STR	16'-8"	35
B8	4	9	2	23'-7"	321
B9	4	4	STR	14'-8"	39
B10	4	4	STR	2'-7"	7
H1	18	5	3	11'-0"	207
H2	16	5	3	9'-0"	150
K1	16	4	STR	21'-10"	233
K2	4	4	STR	3'-2"	8
K3	4	4	STR	2'-2"	6
S1	17	4	5	7'-5"	84
S2	20	4	5	8'-8"	116
S3	37	4	4	3'-2"	78
S4	16	4	7	6'-6"	69
U1	36	4	6	3'-8"	88
U2	18	4	6	5'-5"	65
V1	72	5	STR	5'-1"	382
V2	30	5	STR	8'-1"	253
V3	24	5	STR	6'-9"	169

REINFORCING STEEL (LBS.) 3629

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP & LOWER WINGS)	14.9 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	8.1 C.Y.
TOTAL CLASS A CONCRETE	23.0 C.Y.

HP 12 x 53 STEEL PILES  
NO. = 8 80.0 LIN. FEET

PILE EXCAVATION IN SOIL = 14 LIN. FT.  
PILE EXCAVATION NOT IN SOIL = 16 LIN. FT.  
(PILES 1 THROUGH 3)

STEEL PILE POINTS = 5 EA.  
(PILES 4 THROUGH 8)

PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1



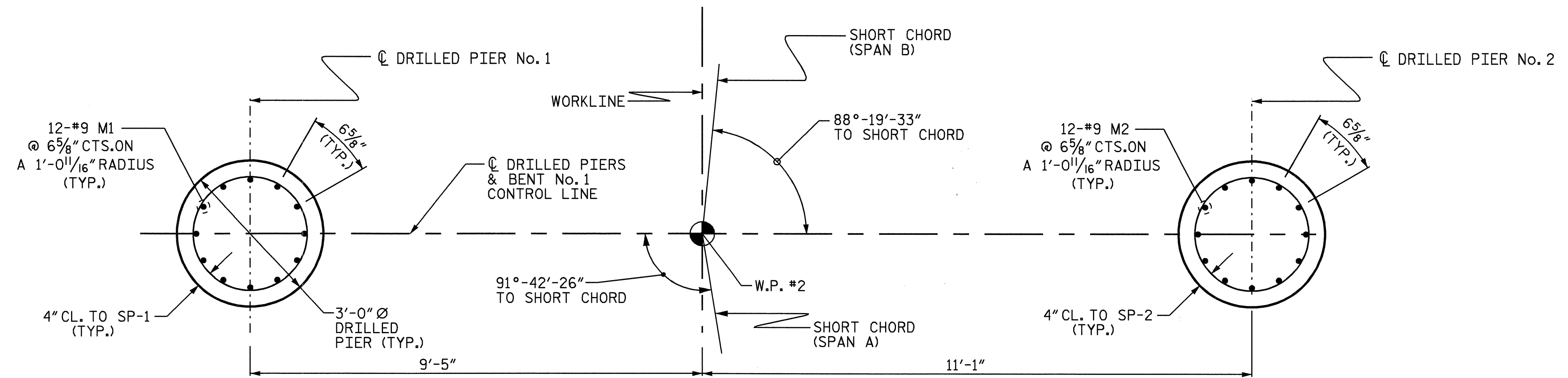
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 36
2			4			

DRAWN BY: S.B. WILLIAMS DATE: 1-06  
CHECKED BY: A.K. PATEL DATE: 1-06

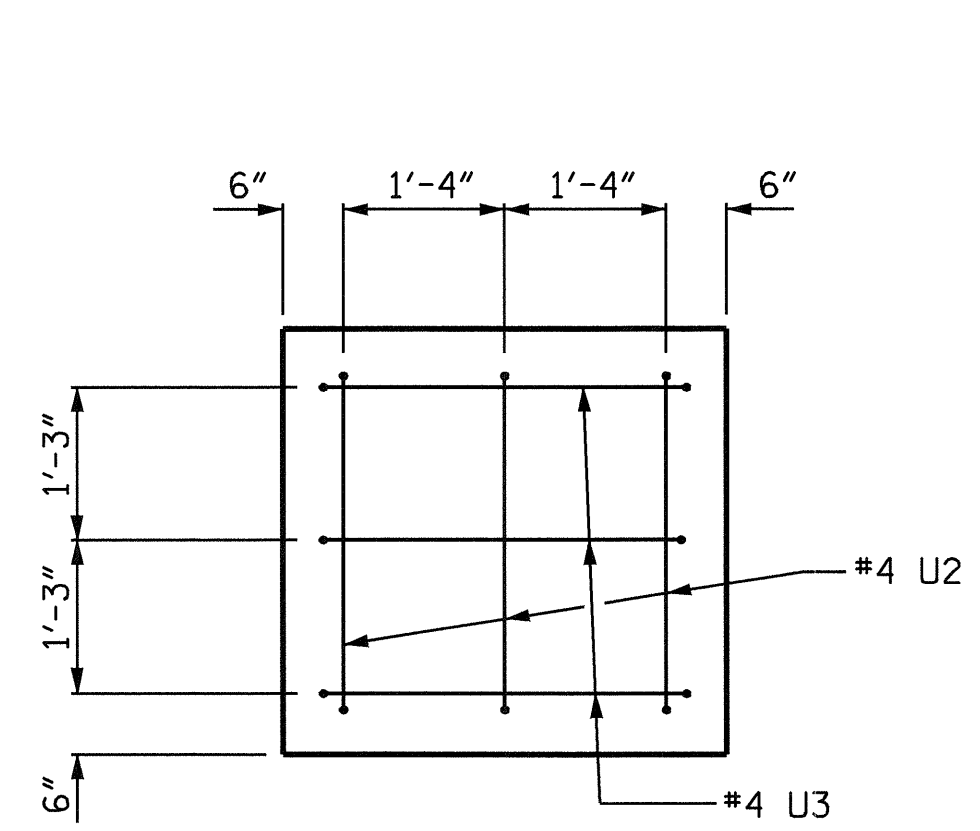


BAR TYPES

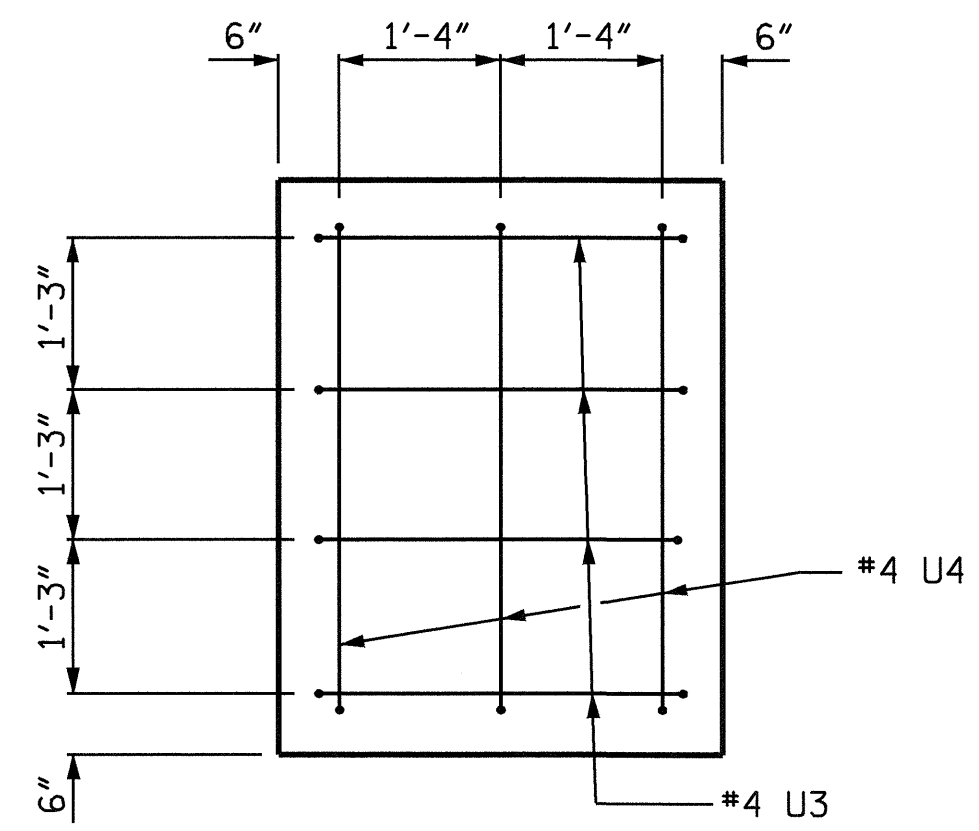
BILL OF MATERIAL



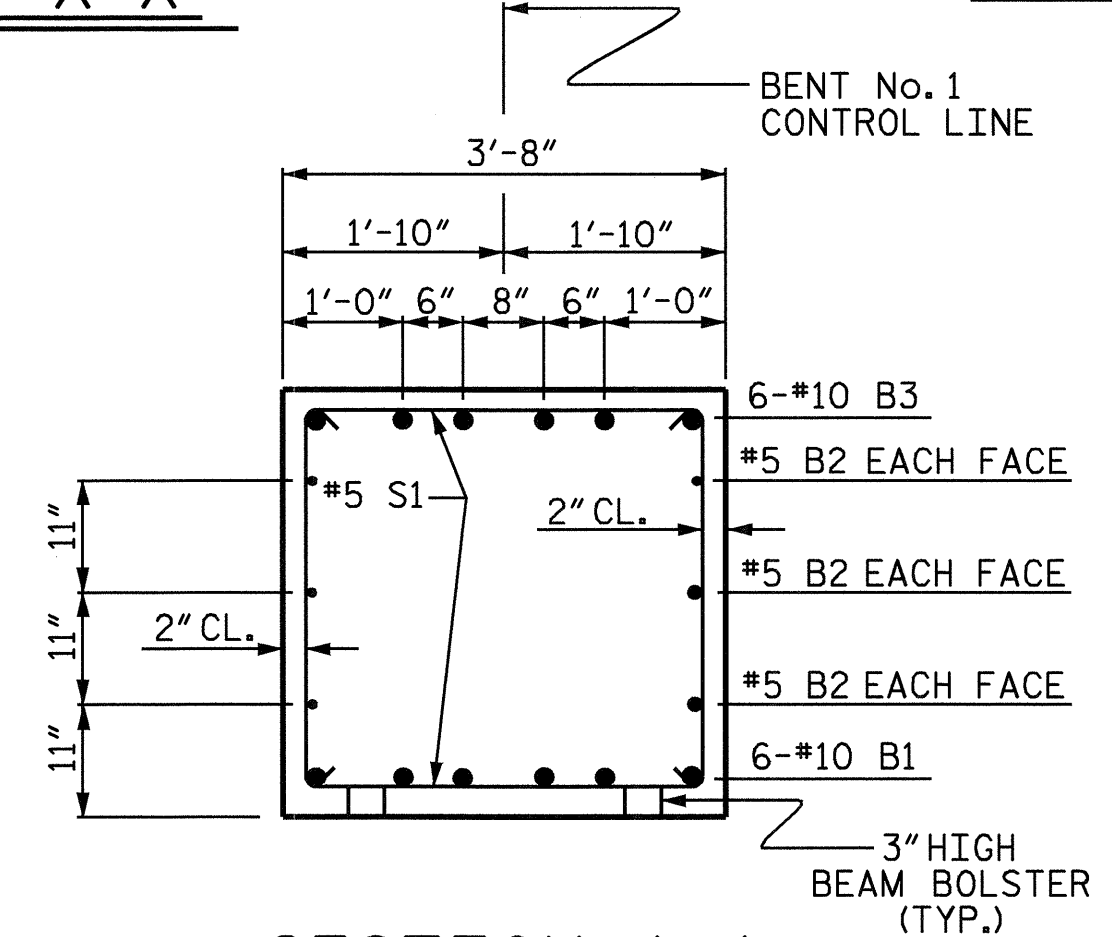
PLAN OF DRILLED PIERS



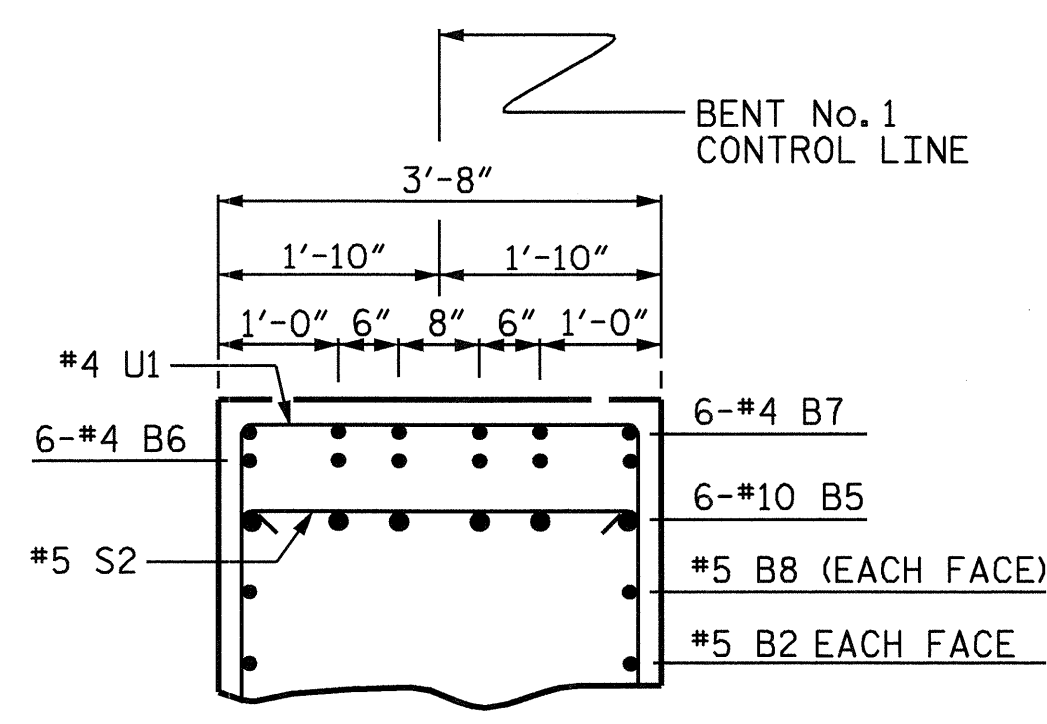
VIEW X-X



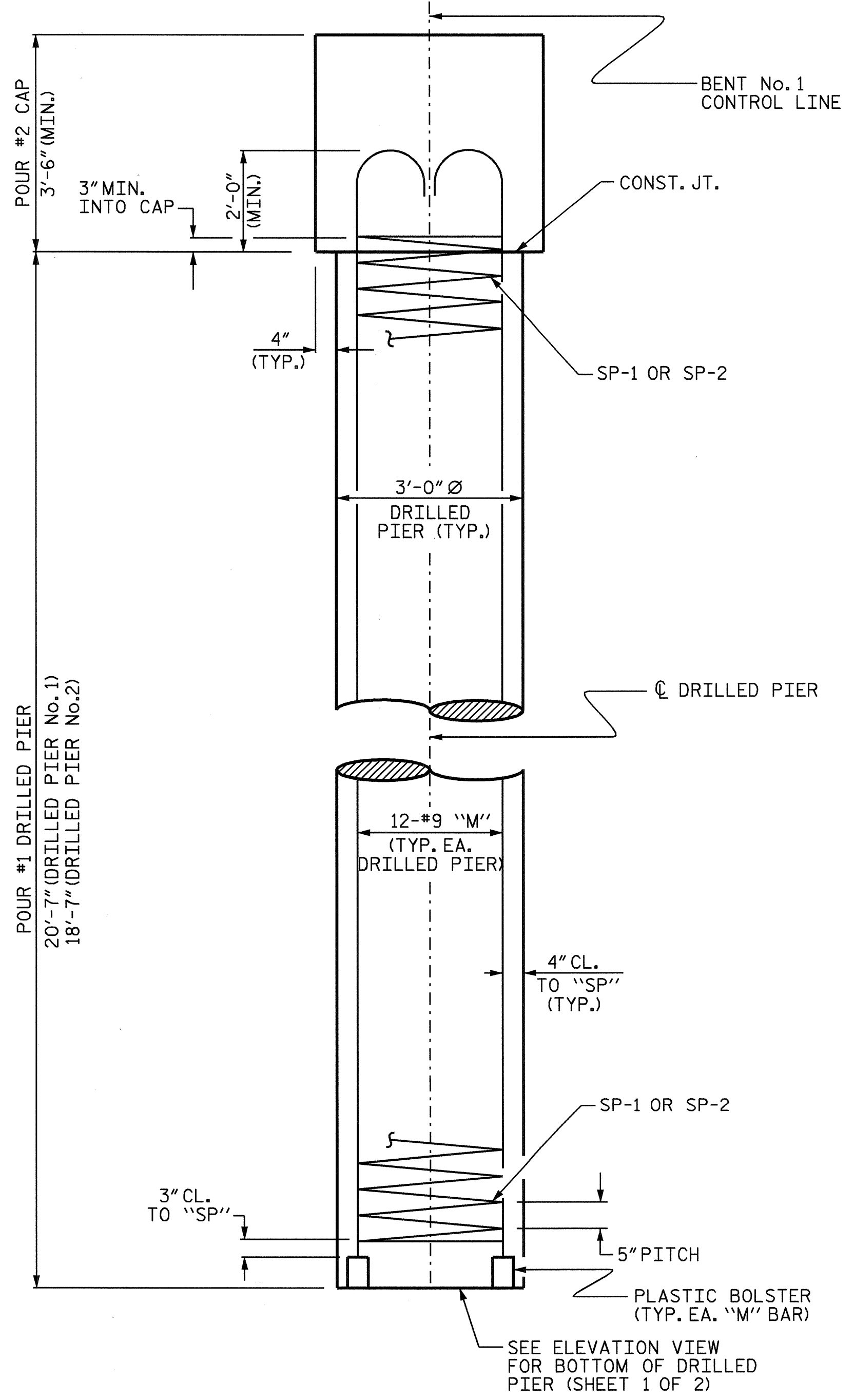
VIEW Y-Y



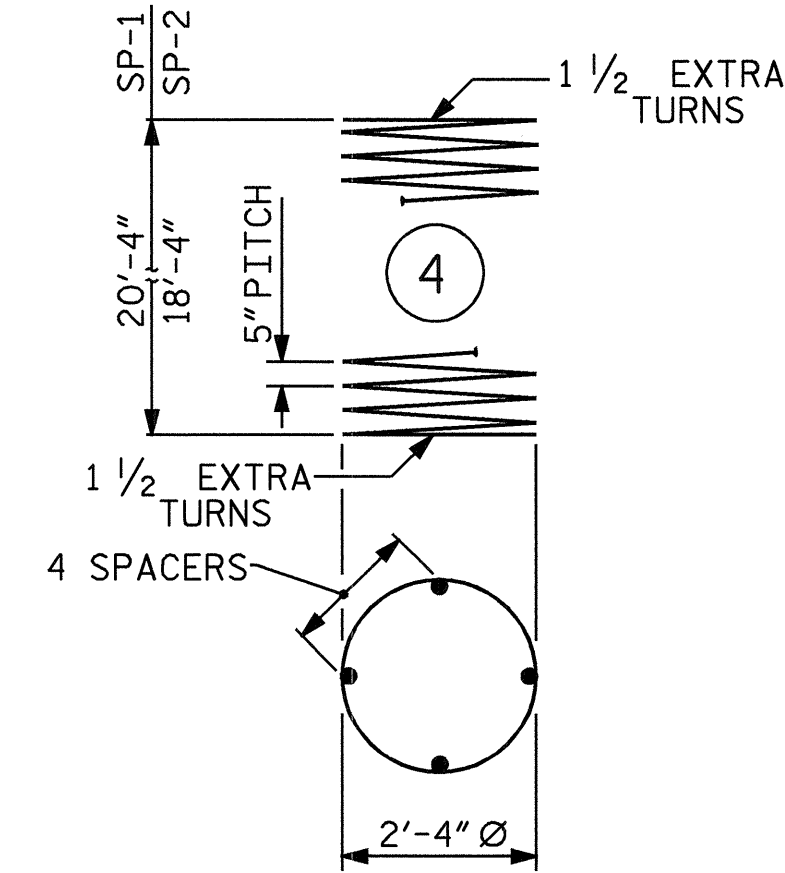
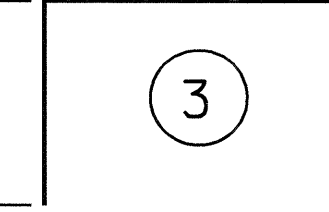
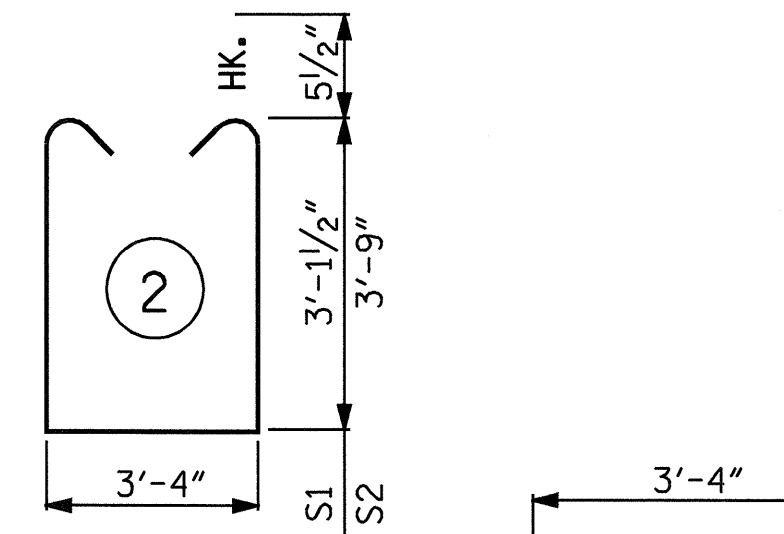
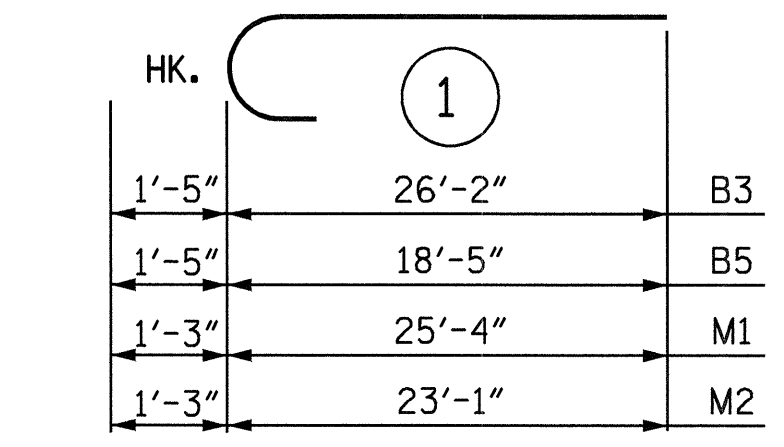
SECTION A-A



SECTION B-B



END ELEVATION



ALL BAR DIMENSIONS ARE OUT TO OUT.

BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	34'-2"	882
B2	6	#5	STR	34'-2"	214
B3	6	#10	1	27'-7"	712
B4	6	#4	STR	7'-6"	30
B5	6	#10	1	19'-10"	512
B6	6	#4	STR	10'-10"	43
B7	6	#4	STR	3'-2"	13
B8	2	#5	STR	11'-0"	23
B9	2	#4	STR	3'-4"	4
M1	12	#9	1	26'-7"	1085
M2	12	#9	1	24'-7"	1003
S1	15	#5	2	10'-6"	164
S2	18	#5	2	11'-9"	221
U1	36	#4	3	6'-4"	152
U2	3	#4	3	6'-0"	16
U3	7	#4	3	6'-2"	29
U4	3	#4	3	7'-2"	14

REINFORCING STEEL						5113 LBS.
SP-1	1	**	4	373'-4"	389	
SP-2	1	**	4	337'-5"	352	
SPIRAL COLUMN REINFORCING STEEL						741 LBS.

\*\* THE SP-1 & SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (CAP)	= 18.9 C.Y.
TOTAL CLASS A CONCRETE	= 18.9 C.Y.
DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	= 10.3 C.Y.
3'-0" Ø DRILLED PIER IN SOIL	= 25.2 LIN. FT.
3'-0" Ø DRILLED PIER NOT IN SOIL	= 14.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS	= 27.1 LIN. FT.
CSL TUBES	= 176.7 LIN. FT.

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

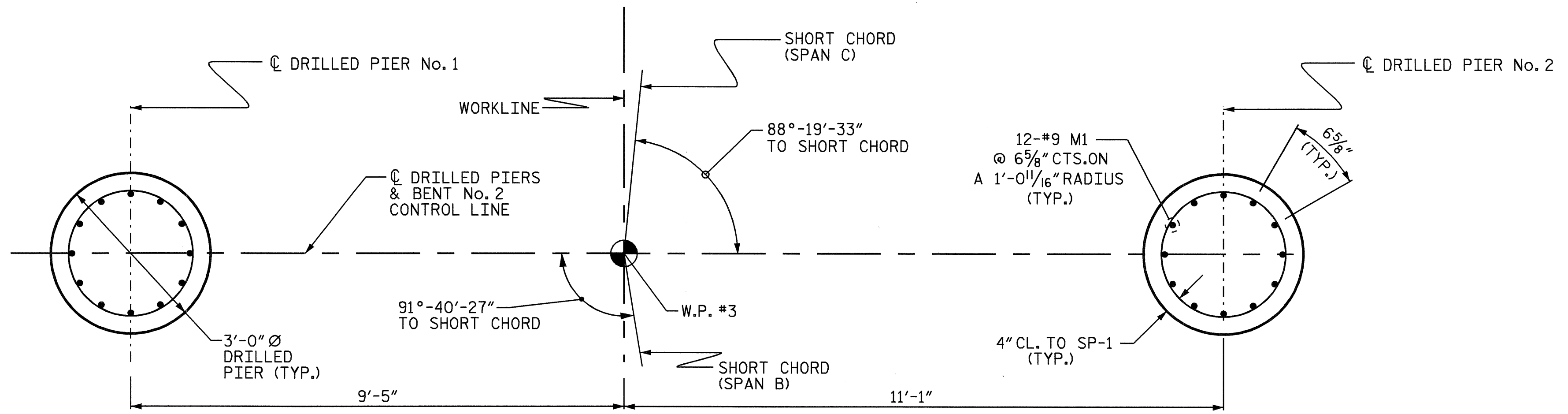
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : S.B. WILLIAMS DATE : 5/06  
 CHECKED BY : A.K. PATEL DATE : 5/06



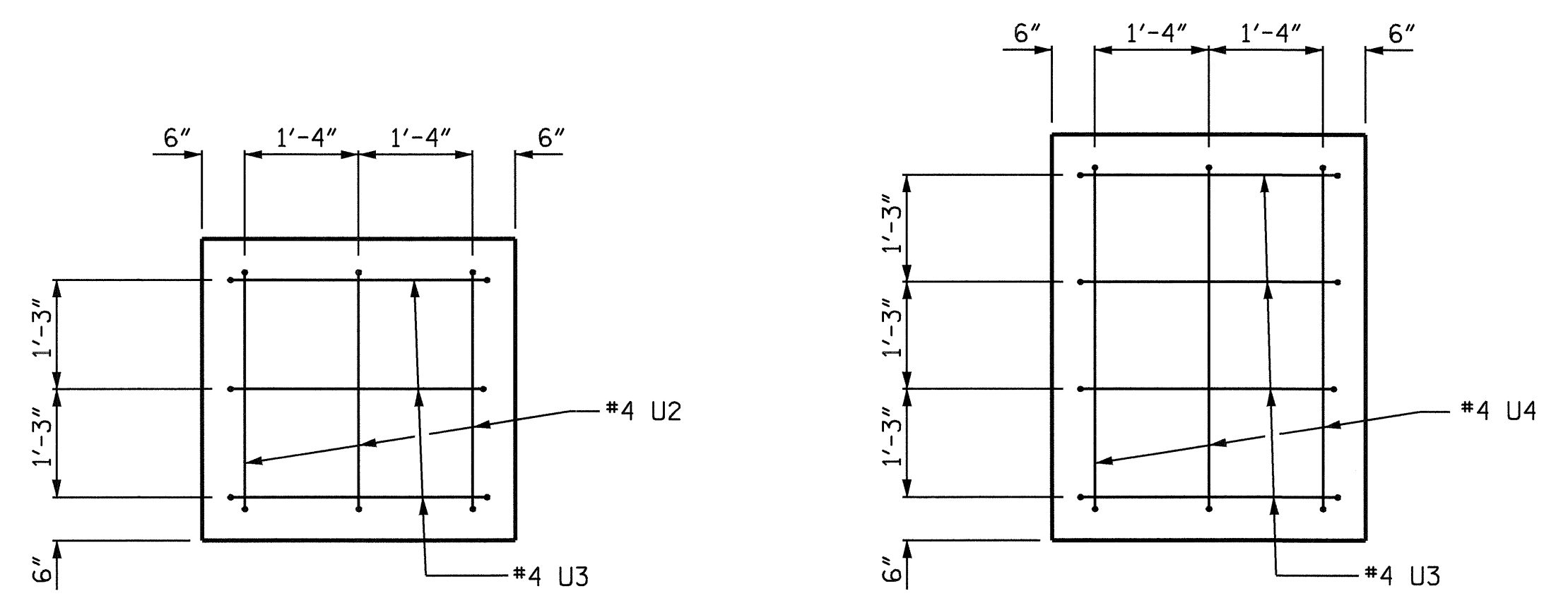






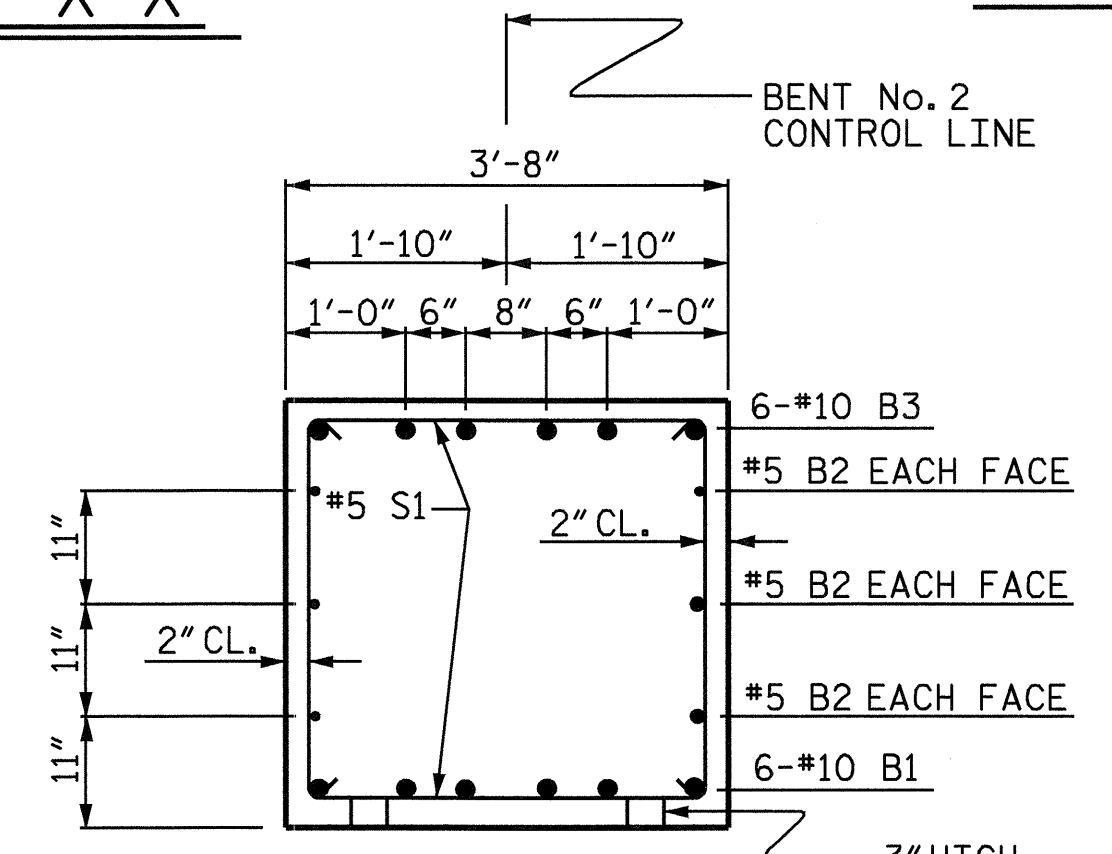
**PLAN OF DRILLED PIERS**

REINFORCING STEEL & DIMENSIONS ARE TYPICAL FOR EACH DRILLED PIER

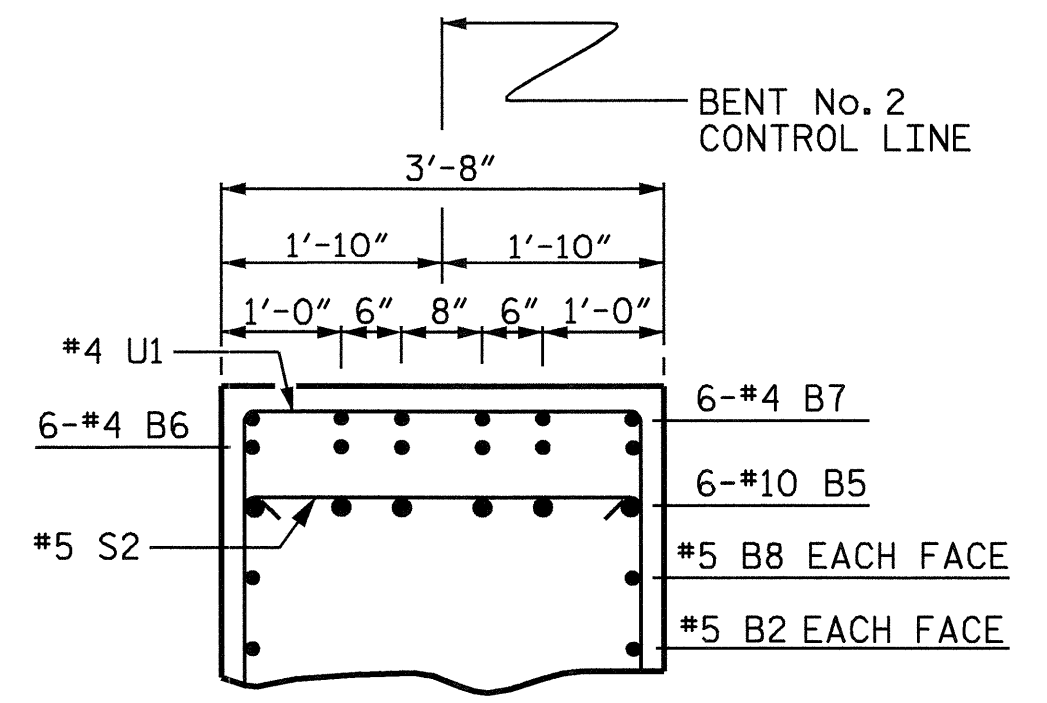


**VIEW X-X**

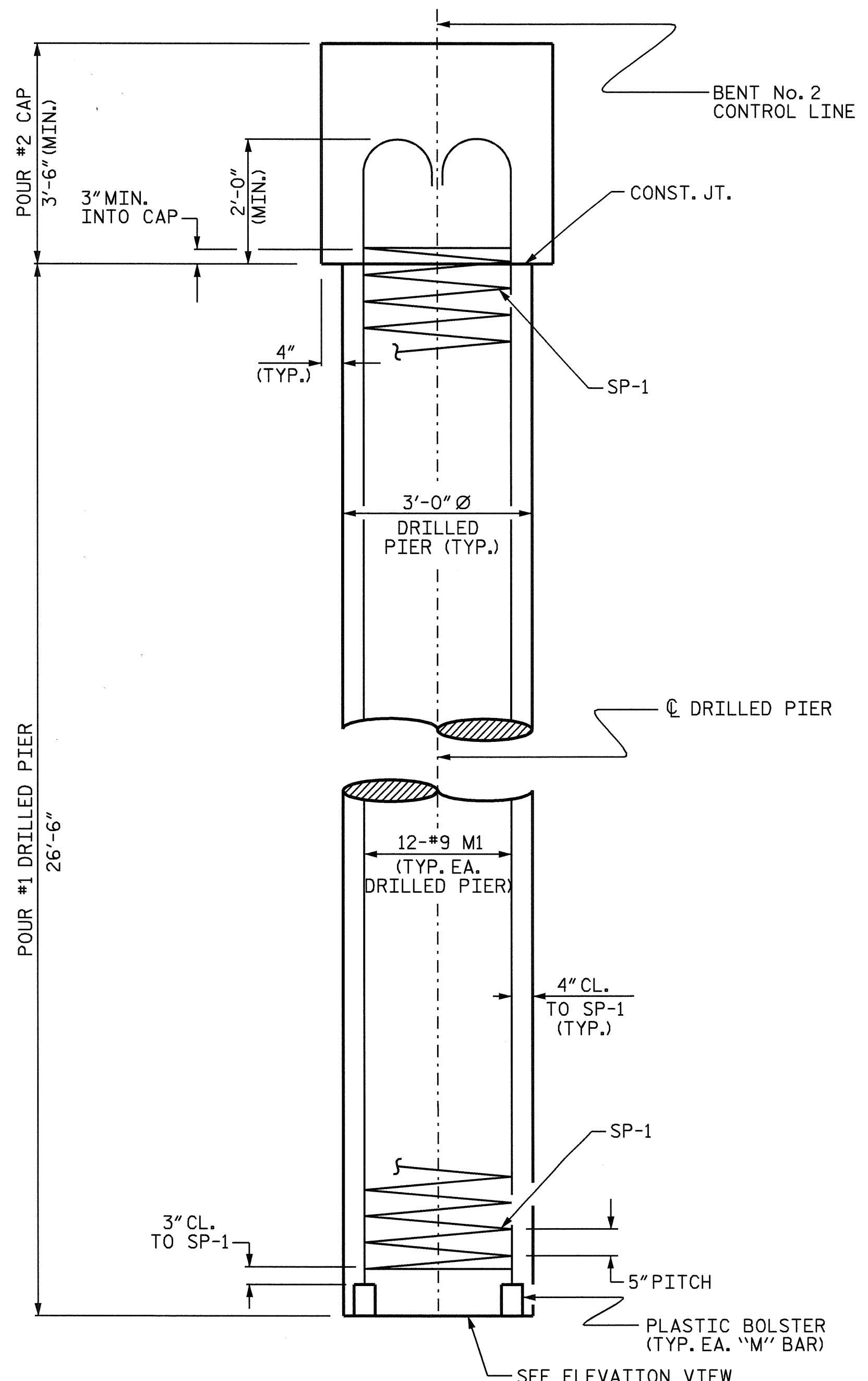
**VIEW Y-Y**



**SECTION A-A**

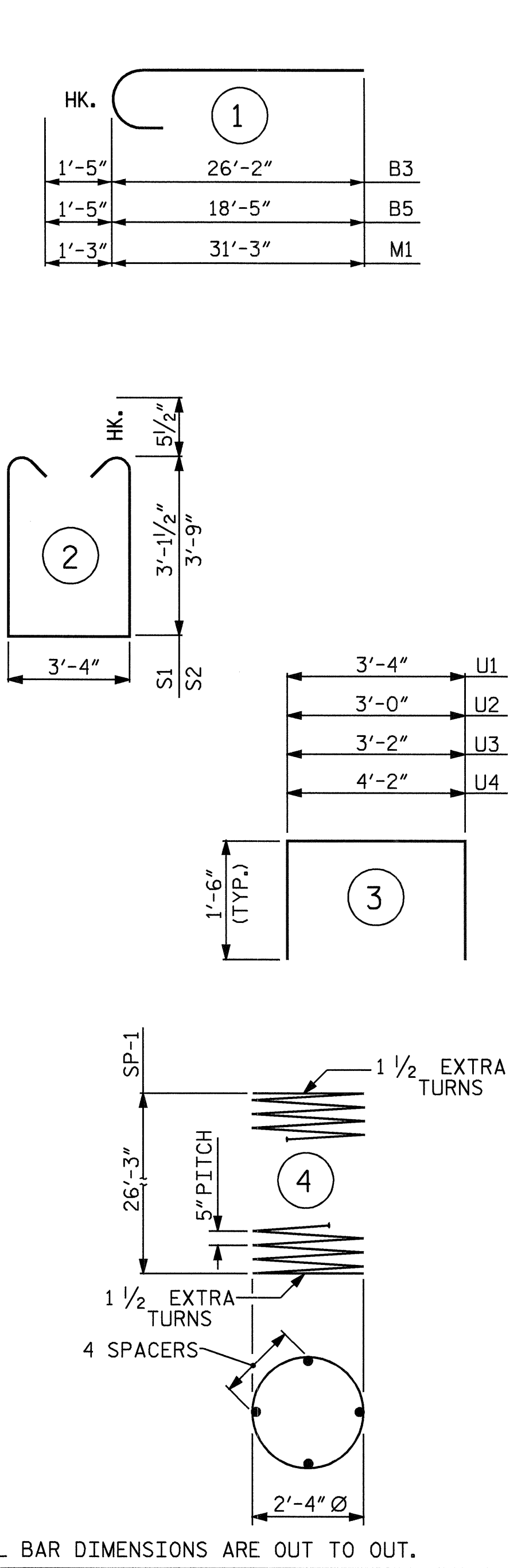


**SECTION B-B**



**END ELEVATION**

**BAR TYPES**



**BILL OF MATERIAL**

BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	34'-2"	882
B2	6	#5	STR	34'-2"	214
B3	6	#10	1	27'-7"	712
B4	6	#4	STR	7'-6"	30
B5	6	#10	1	19'-10"	512
B6	6	#4	STR	10'-10"	43
B7	6	#4	STR	3'-2"	13
B8	2	#5	STR	11'-0"	23
B9	2	#4	STR	3'-4"	4
M1	24	#9	1	32'-6"	2652
S1	15	#5	2	10'-6"	164
S2	18	#5	2	11'-9"	221
U1	36	#4	3	6'-4"	152
U2	3	#4	3	6'-0"	12
U3	7	#4	3	6'-2"	29
U4	3	#4	3	7'-2"	14
REINFORCING STEEL					5677 LBS.
SP-1	2	**	4	473'-10"	988
SPIRAL COLUMN REINFORCING STEEL					988 LBS.
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (CAP)					= 18.9 C.Y.
TOTAL CLASS A CONCRETE					= 18.9 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					= 13.9 C.Y.
3'-0" Ø DRILLED PIER IN SOIL					= 39.0 LIN. FT.
3'-0" Ø DRILLED PIER NOT IN SOIL					= 14.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS					= 41.0 LIN. FT.
CSL TUBES					= 232.0 LIN. FT.

ALL BAR DIMENSIONS ARE OUT TO OUT.

DRAWN BY : S.B. WILLIAMS DATE : 5/06  
 CHECKED BY : A.K. PATEL DATE : 6/06

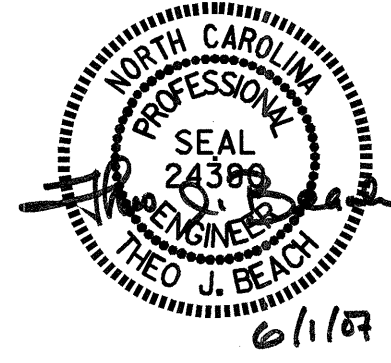
PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

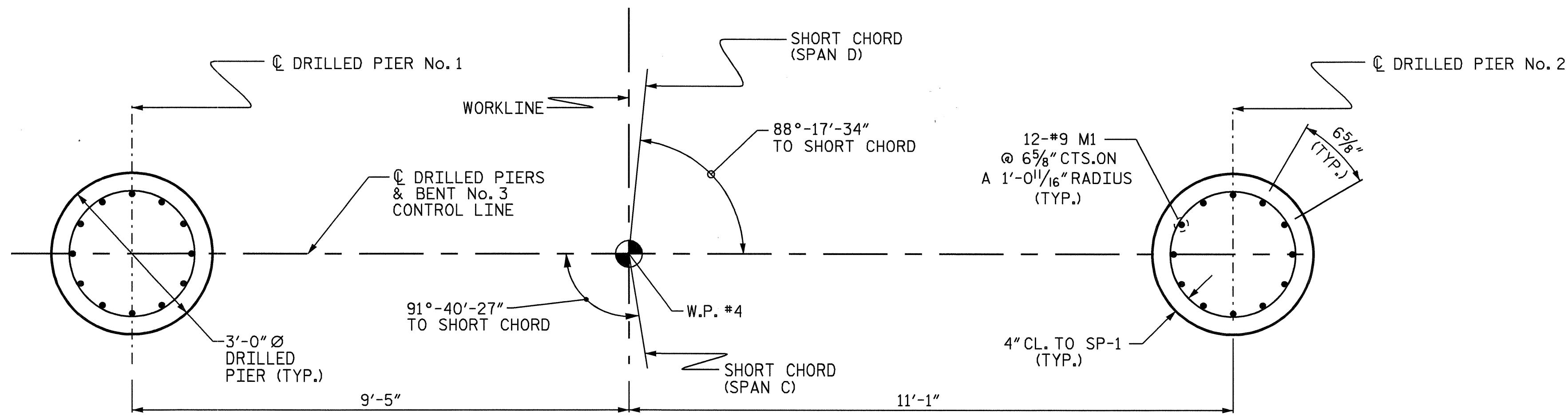
**SUBSTRUCTURE**  
**BENT No. 2**

REVISIONS						NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1				3		1			3			S-28
2				4		2			4			TOTAL SHEETS 36



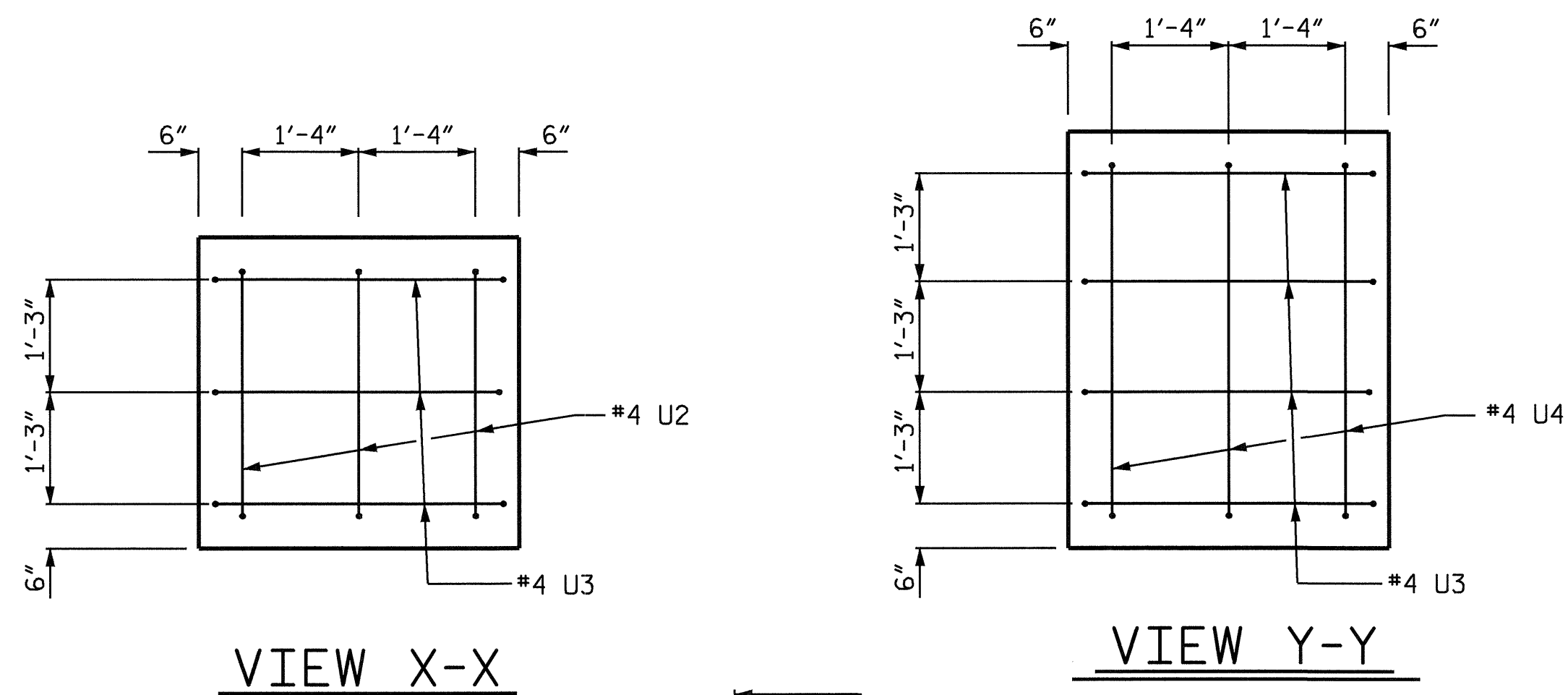






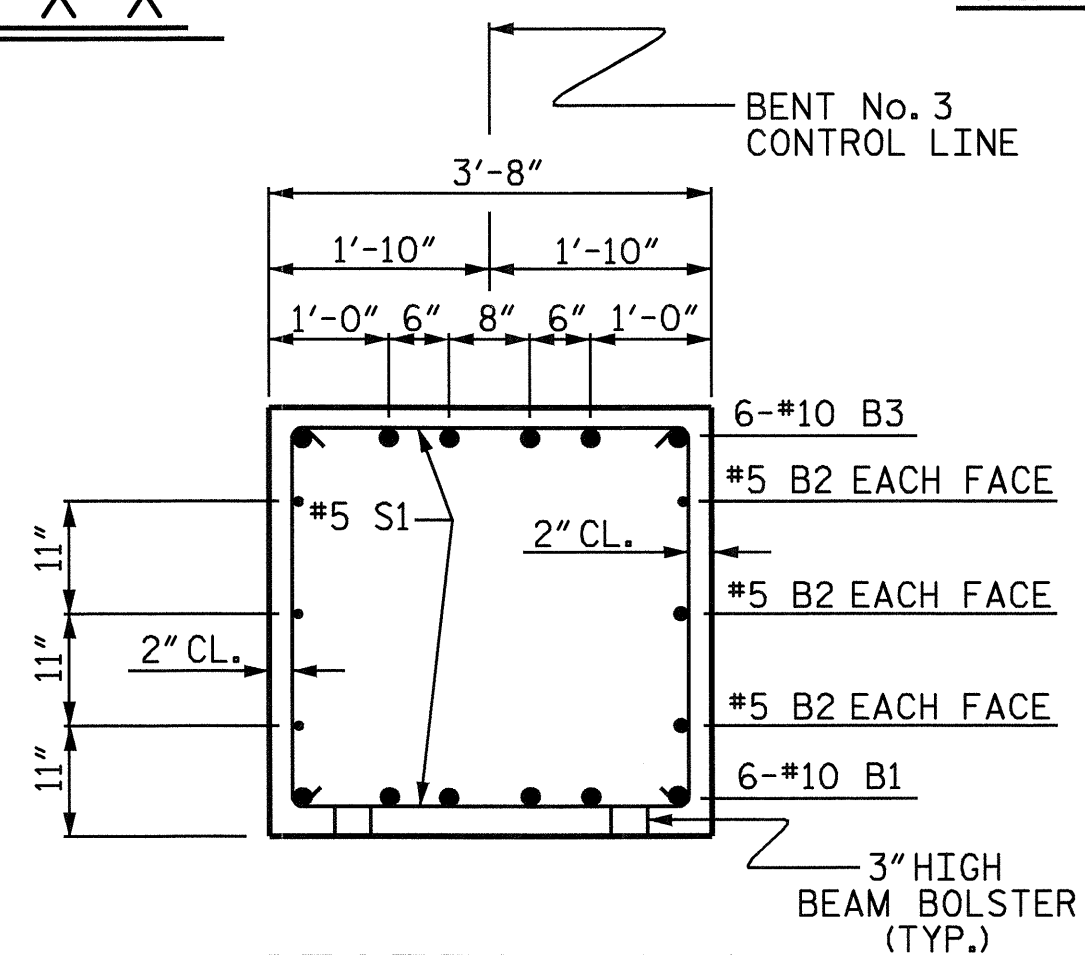
**PLAN OF DRILLED PIERS**

(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH DRILLED PIER)

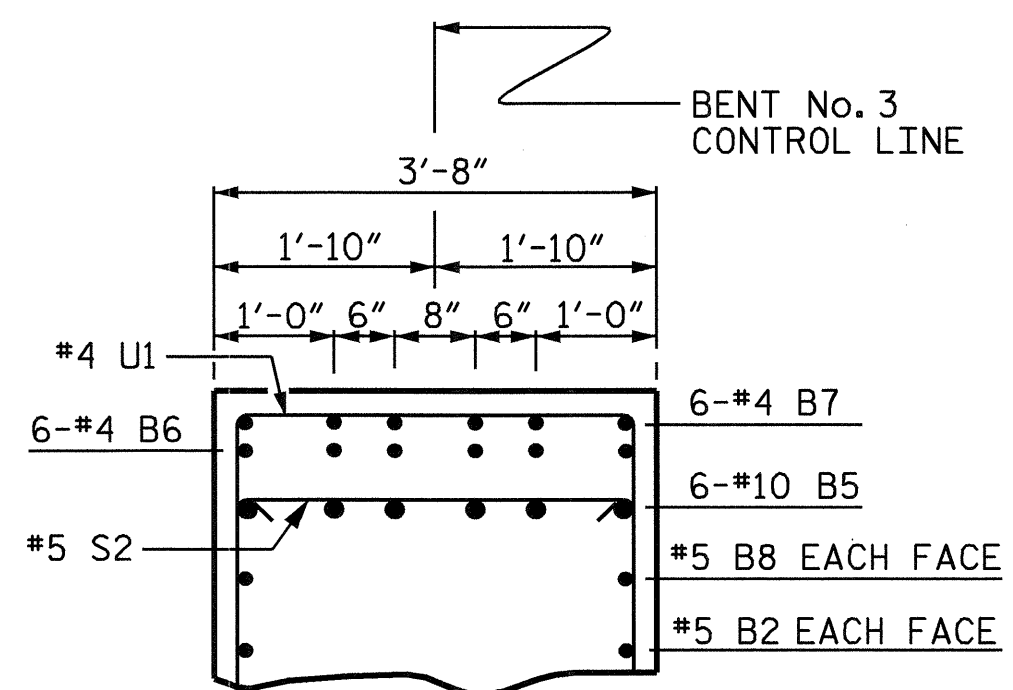


**VIEW X-X**

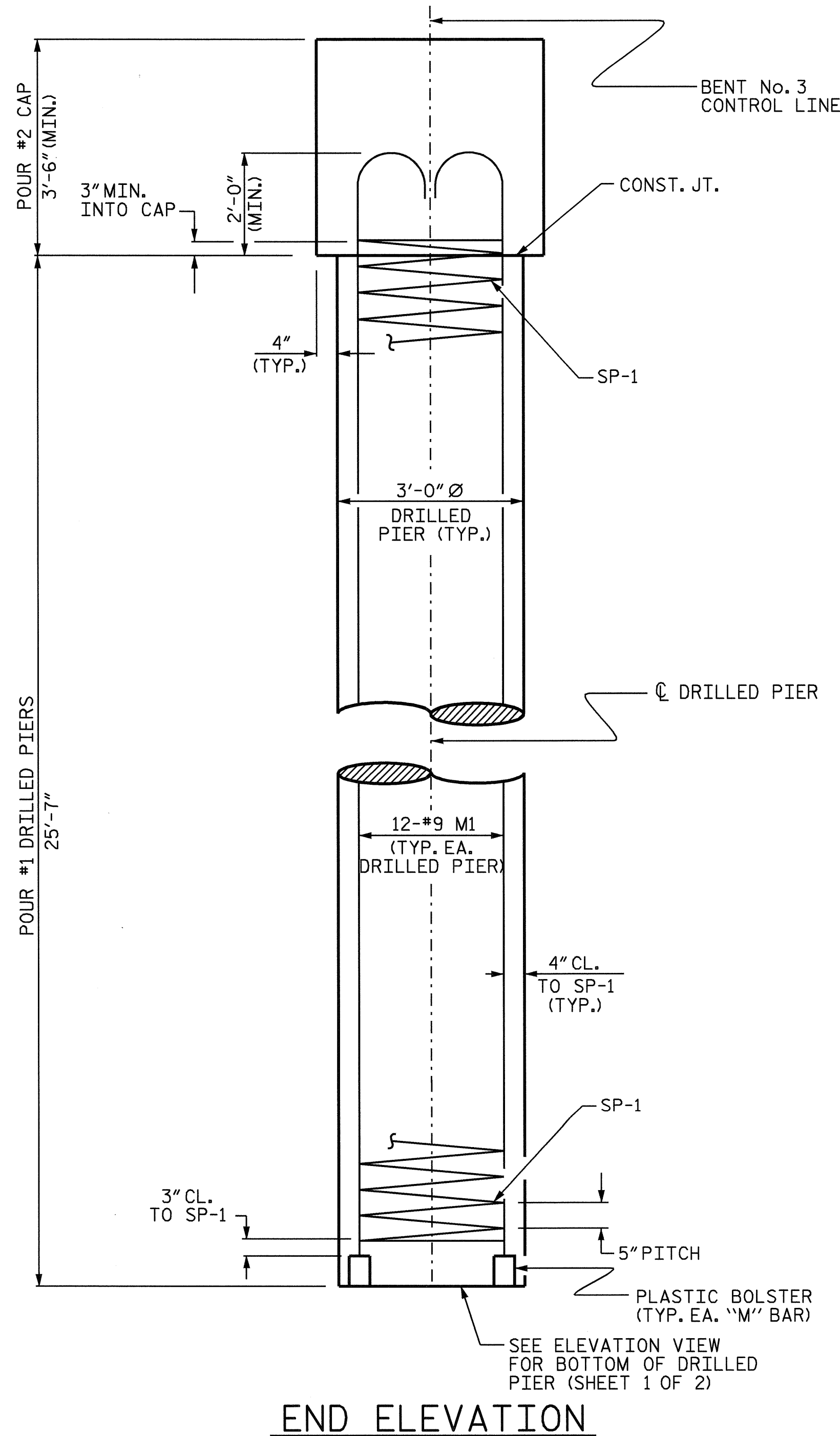
**VIEW Y-Y**



**SECTION A-A**



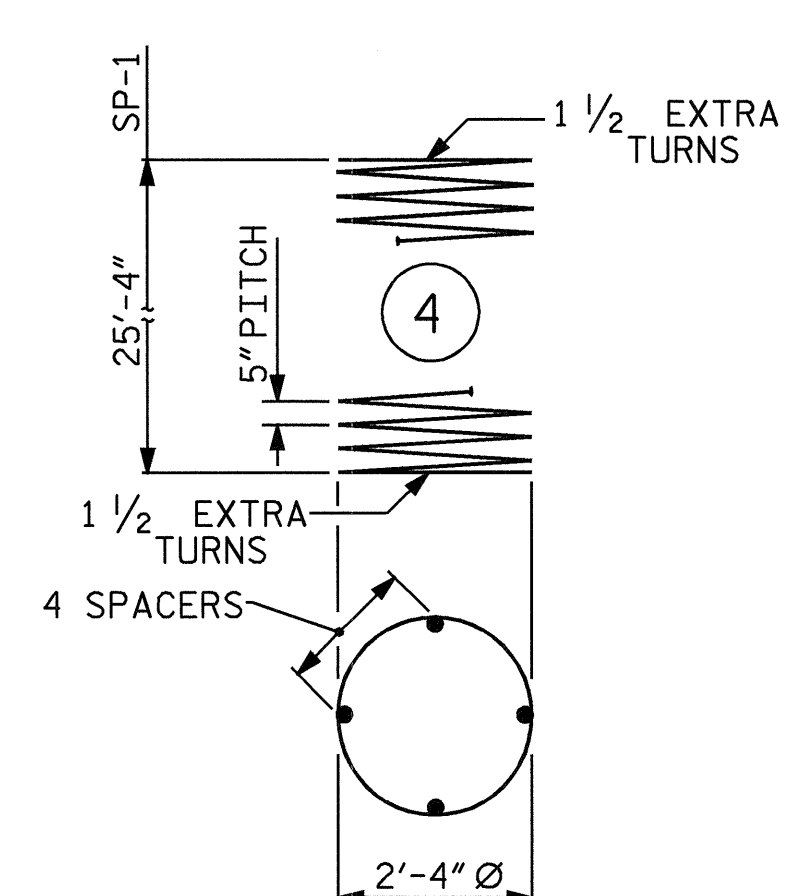
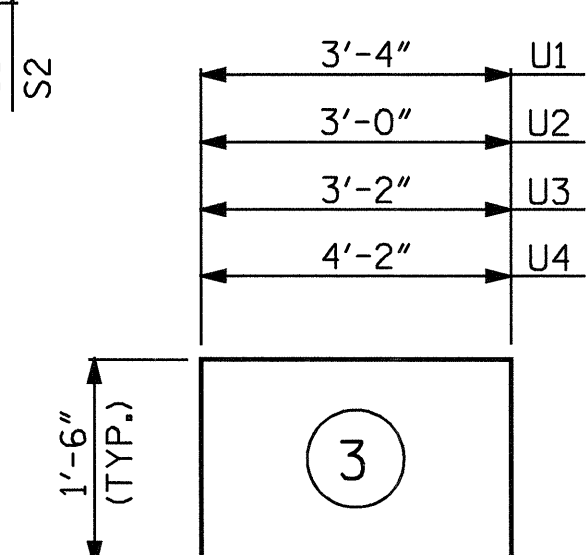
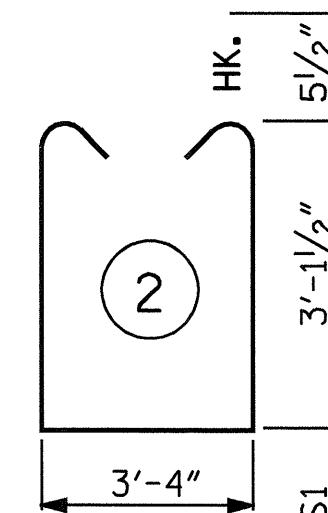
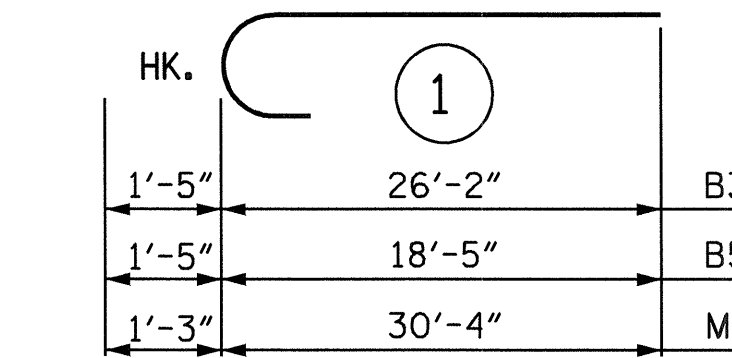
**SECTION B-B**



**END ELEVATION**

SEE ELEVATION VIEW FOR BOTTOM OF DRILLED PIER (SHEET 1 OF 2)

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

BENT No. 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	34'-2"	882
B2	6	#5	STR	34'-2"	214
B3	6	#10	1	27'-7"	712
B4	6	#4	STR	7'-6"	30
B5	6	#10	1	19'-10"	512
B6	6	#4	STR	10'-10"	43
B7	6	#4	STR	3'-2"	13
B8	2	#5	STR	11'-0"	23
B9	2	#4	STR	3'-4"	4
M1	24	#9	1	31'-7"	2577
S1	15	#5	2	10'-6"	164
S2	18	#5	2	11'-9"	221
U1	36	#4	3	6'-4"	152
U2	3	#4	3	6'-0"	12
U3	7	#4	3	6'-2"	29
U4	3	#4	3	7'-2"	14

REINFORCING STEEL 5602 LBS.

SP-1	2	**	4	459'-6"	959
------	---	----	---	---------	-----

SPIRAL COLUMN REINFORCING STEEL 959 LBS.

\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (CAP) = 18.9 C.Y.

TOTAL CLASS A CONCRETE = 18.9 C.Y.

DRILLED PIERS:  
DRILLED PIER CONCRETE  
POUR #1 (DRILLED PIERS) = 13.4 C.Y.

3'-0" Ø DRILLED PIER IN SOIL = 37.2 LIN. FT.

3'-0" Ø DRILLED PIER NOT IN SOIL = 14.0 LIN. FT.

PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS= 39.1 LIN. FT.

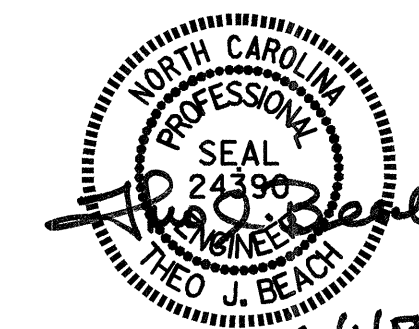
CSL TUBES = 224.7 LIN. FT.

PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

SHEET 2 OF 2

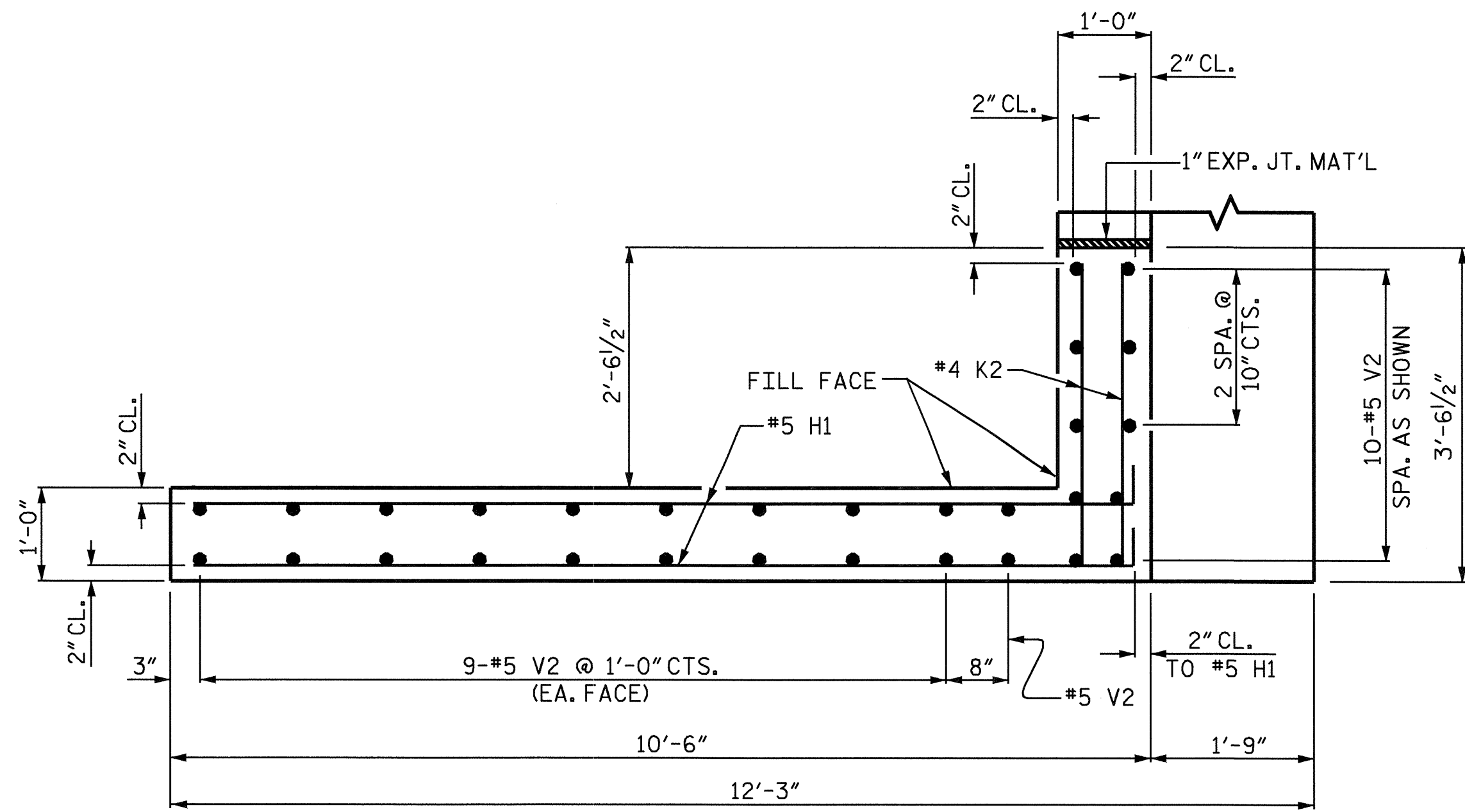
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 3

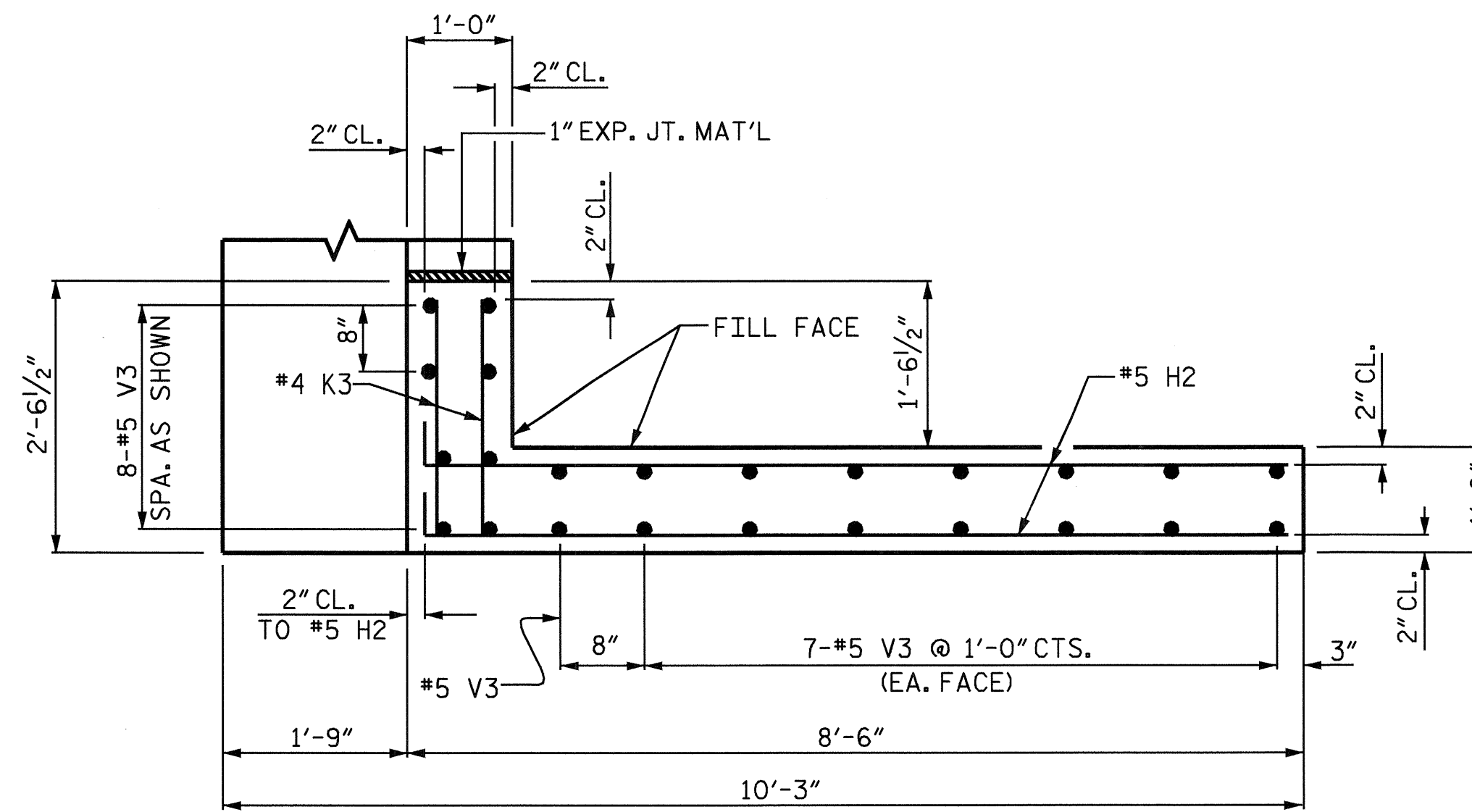


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS 36
2			4			

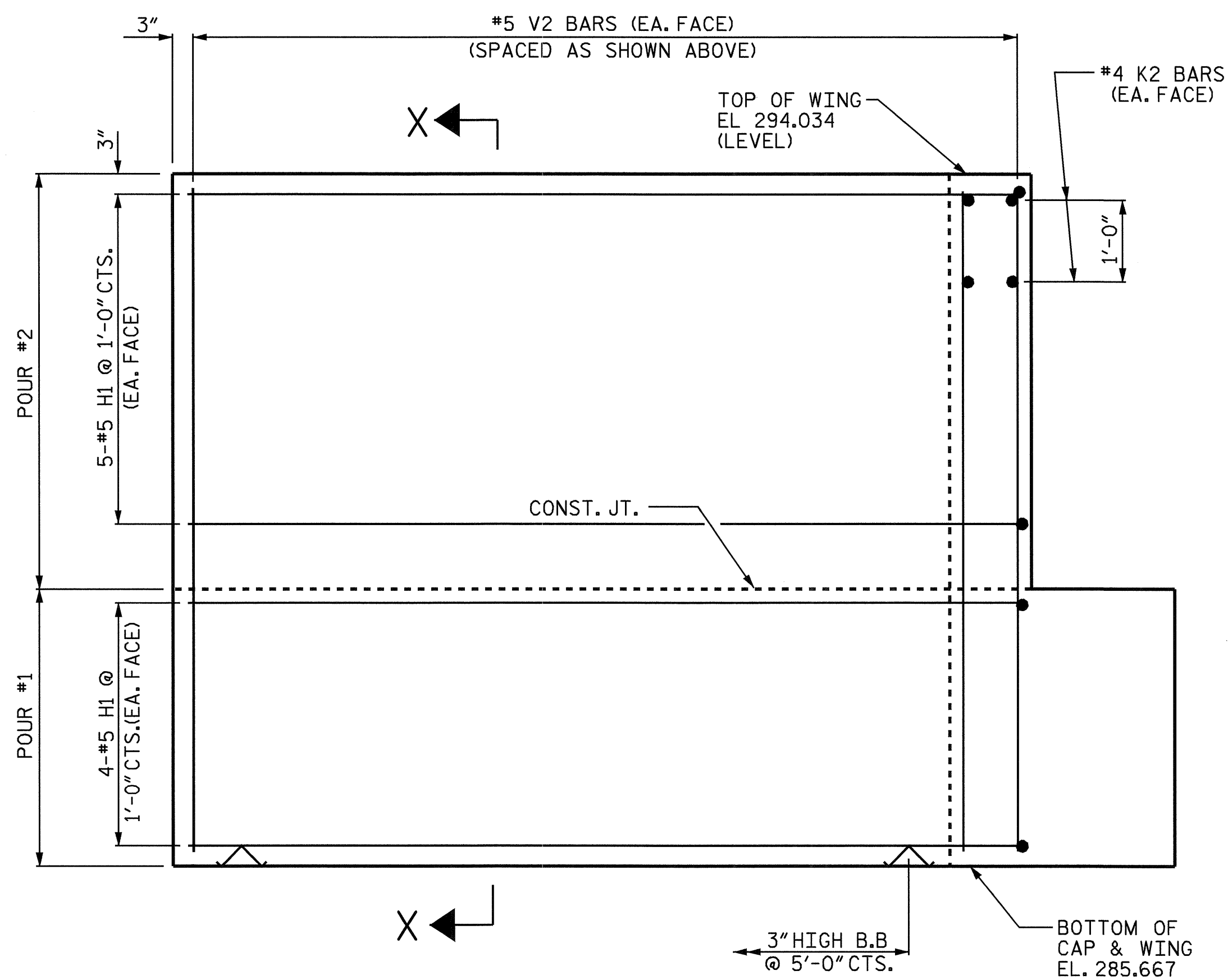




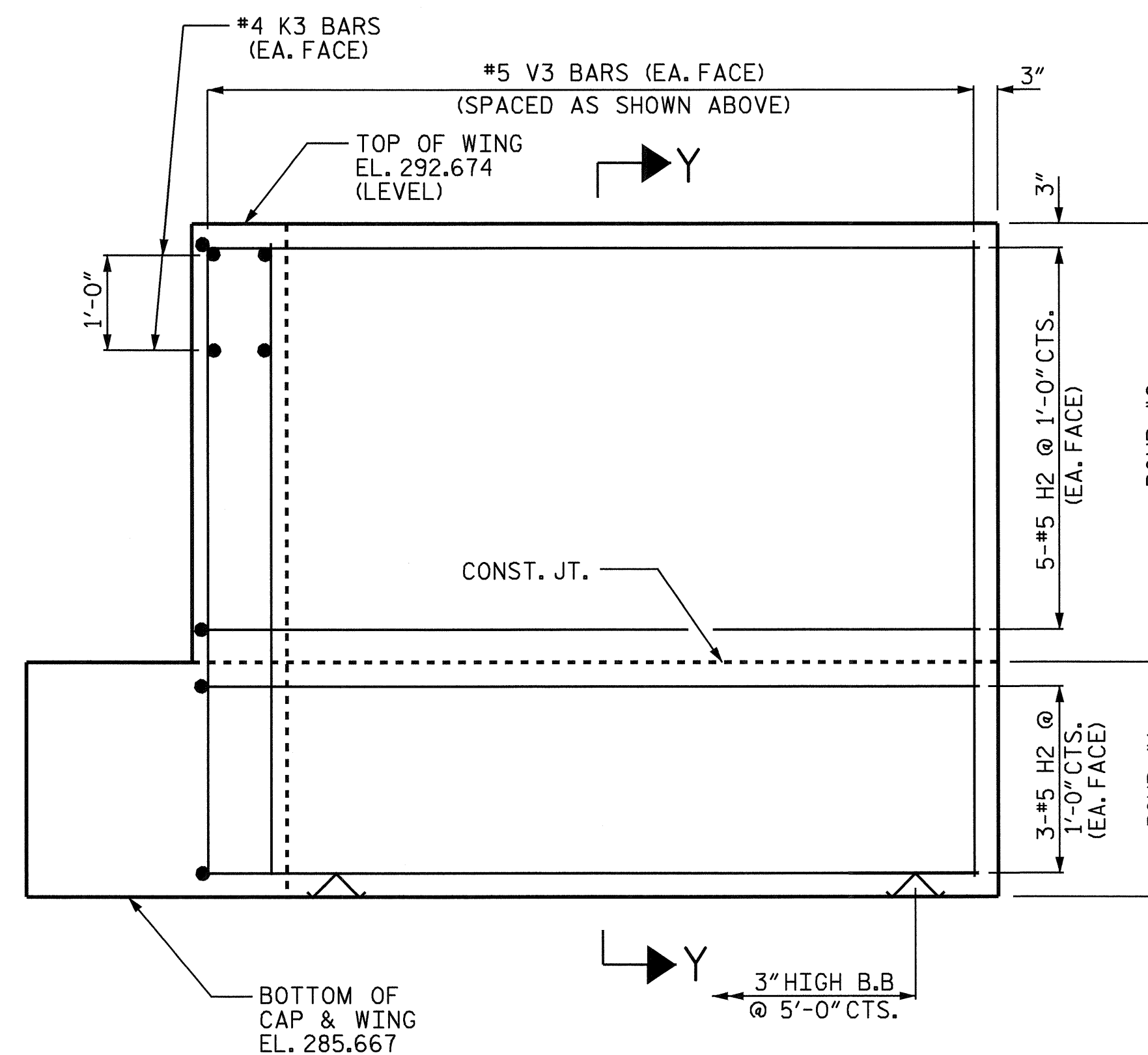
PLAN OF WING (W1)



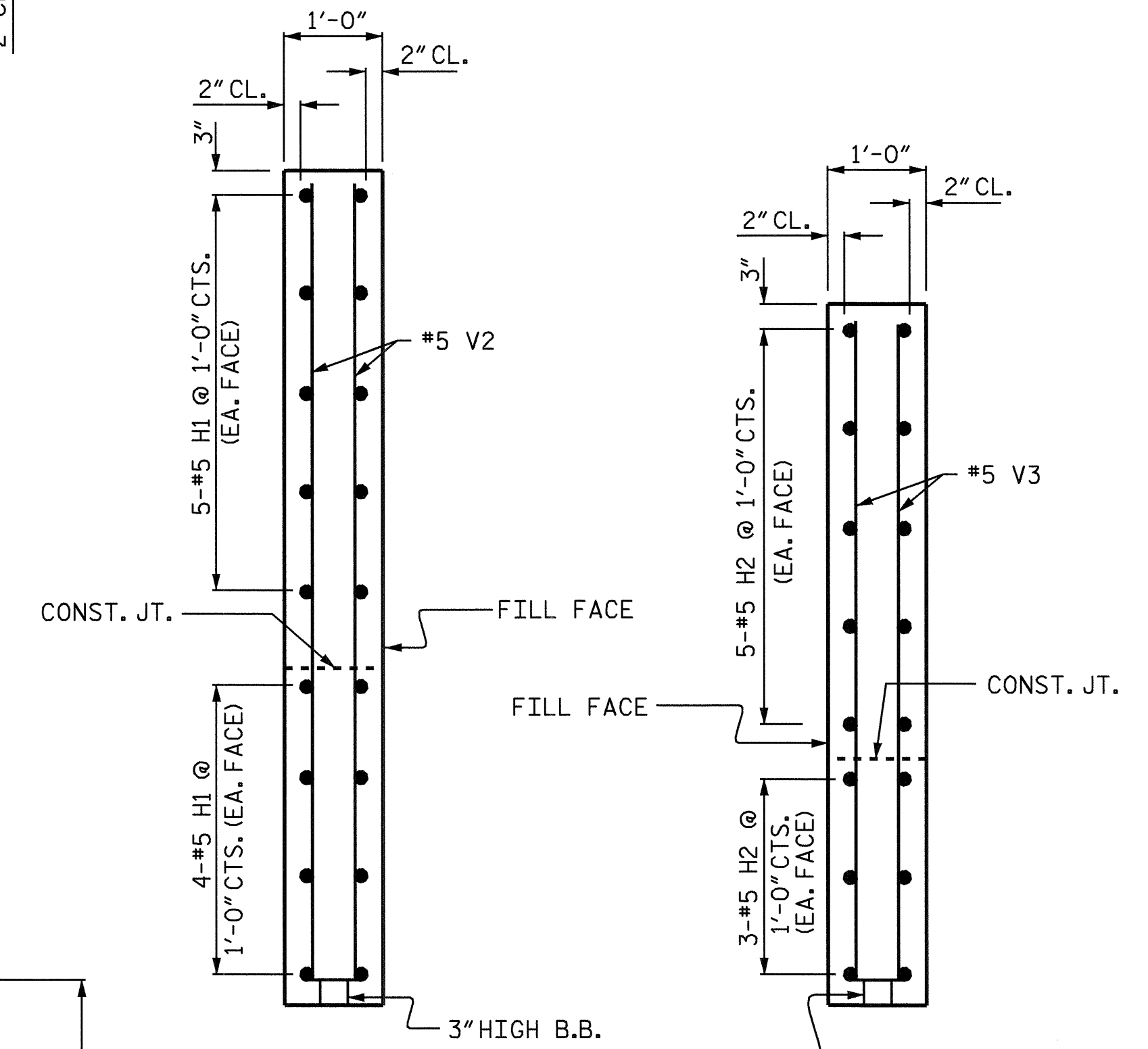
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

SECTION Y-Y

PROJECT NO. B-3917  
 WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2

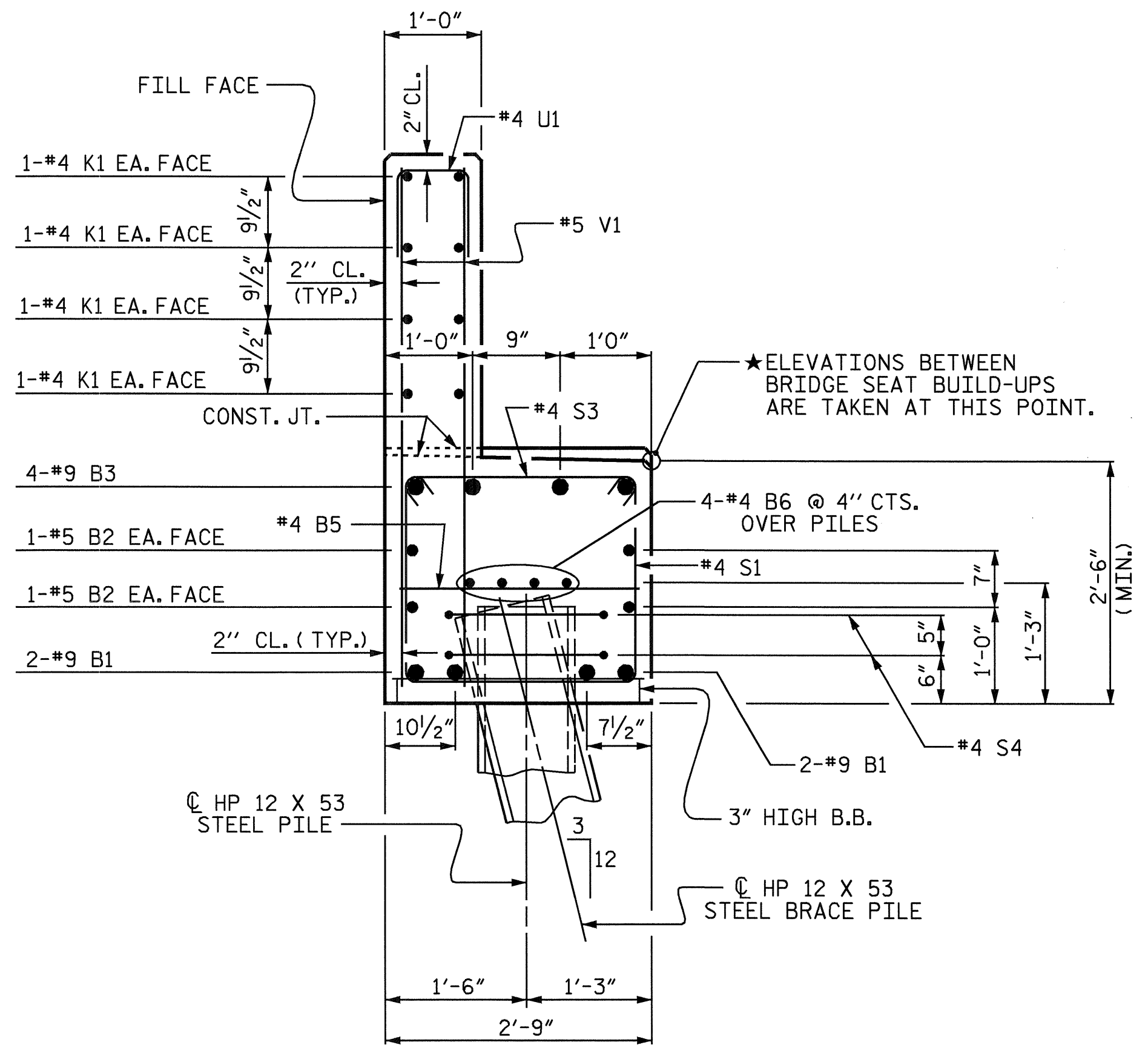


DRAWN BY: S.B. WILLIAMS DATE: 1-06  
 CHECKED BY: A.K. PATEL DATE: 1-06

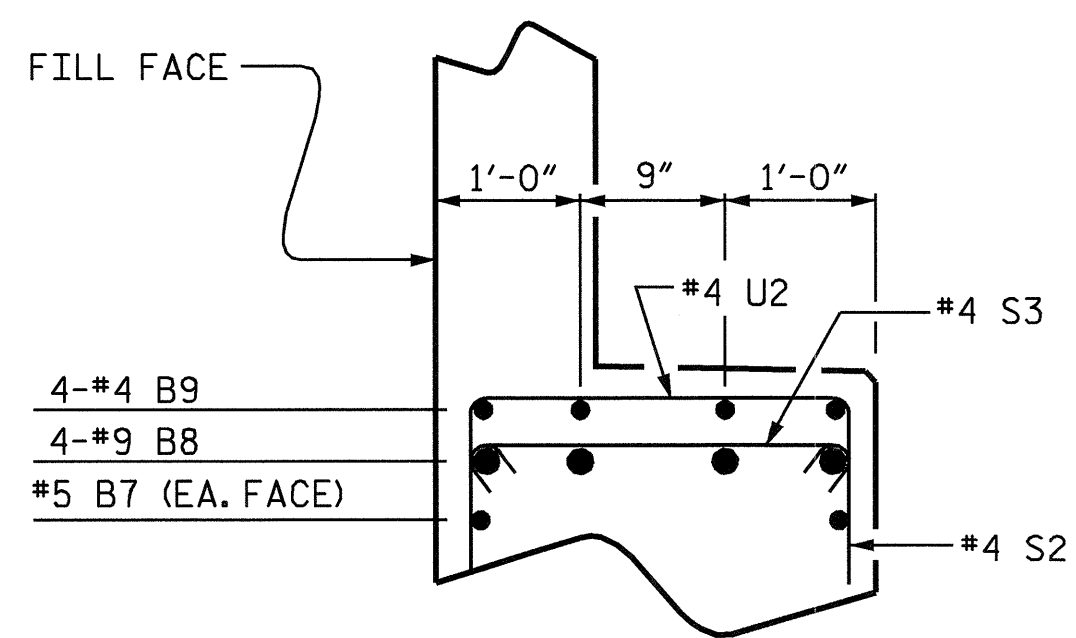
29-MAY-2007 12:38  
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 sbwilliams

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32	
1			3			TOTAL SHEETS	
2			4			36	

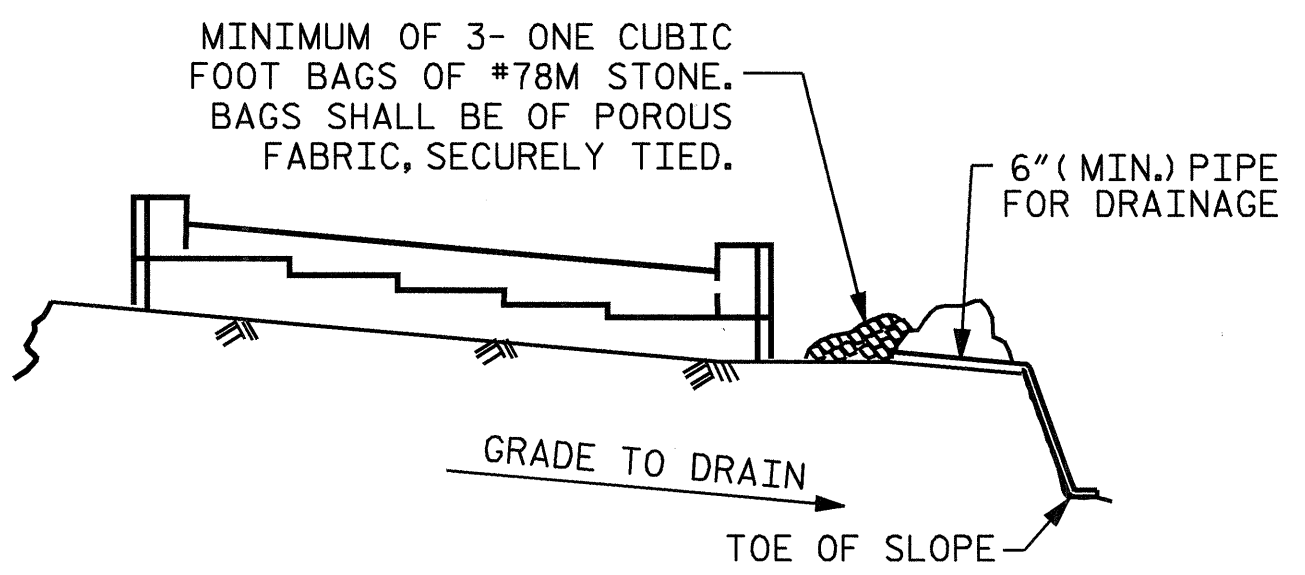




SECTION A-A



PARTIAL SECTION B-B



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

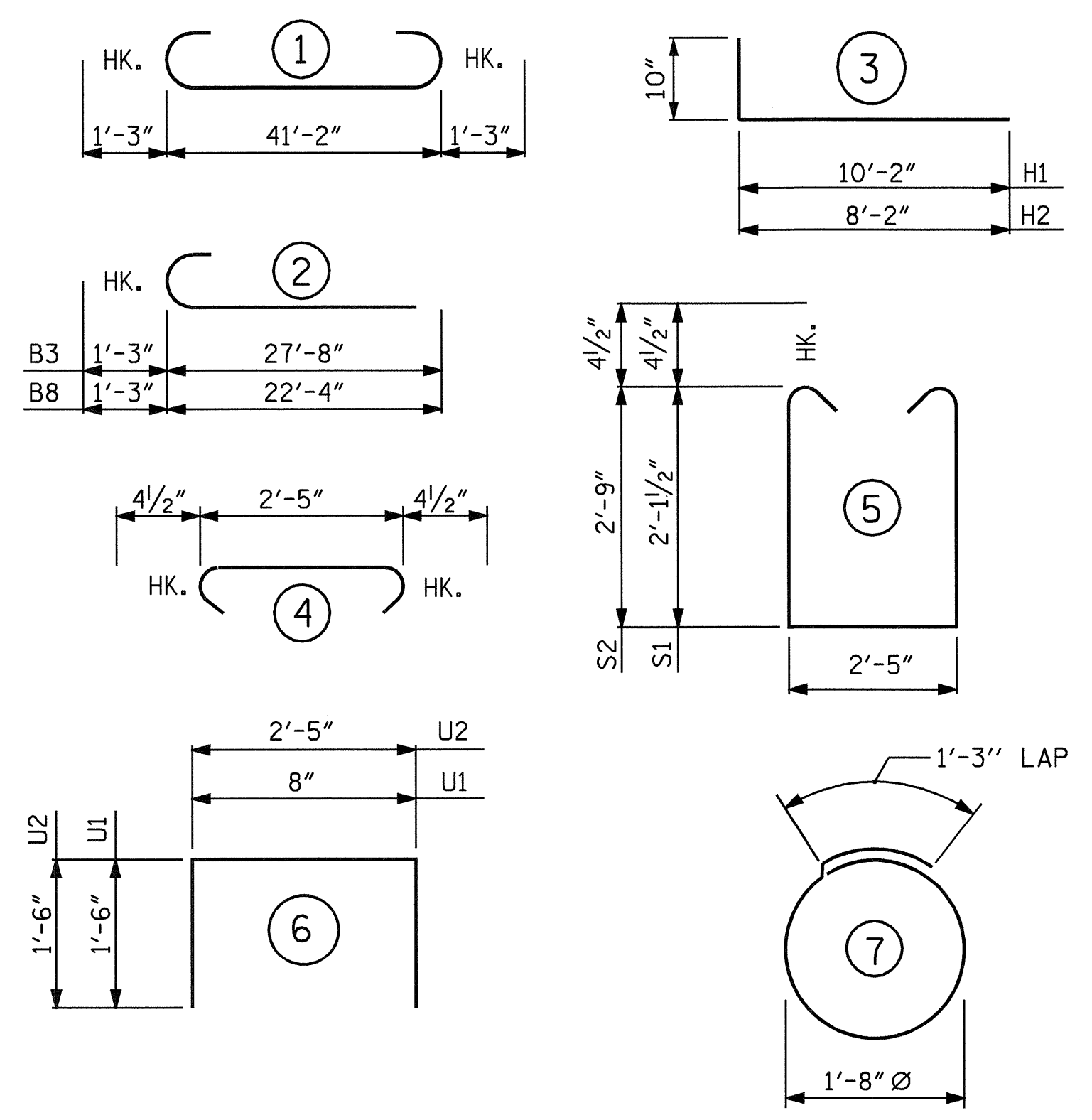
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

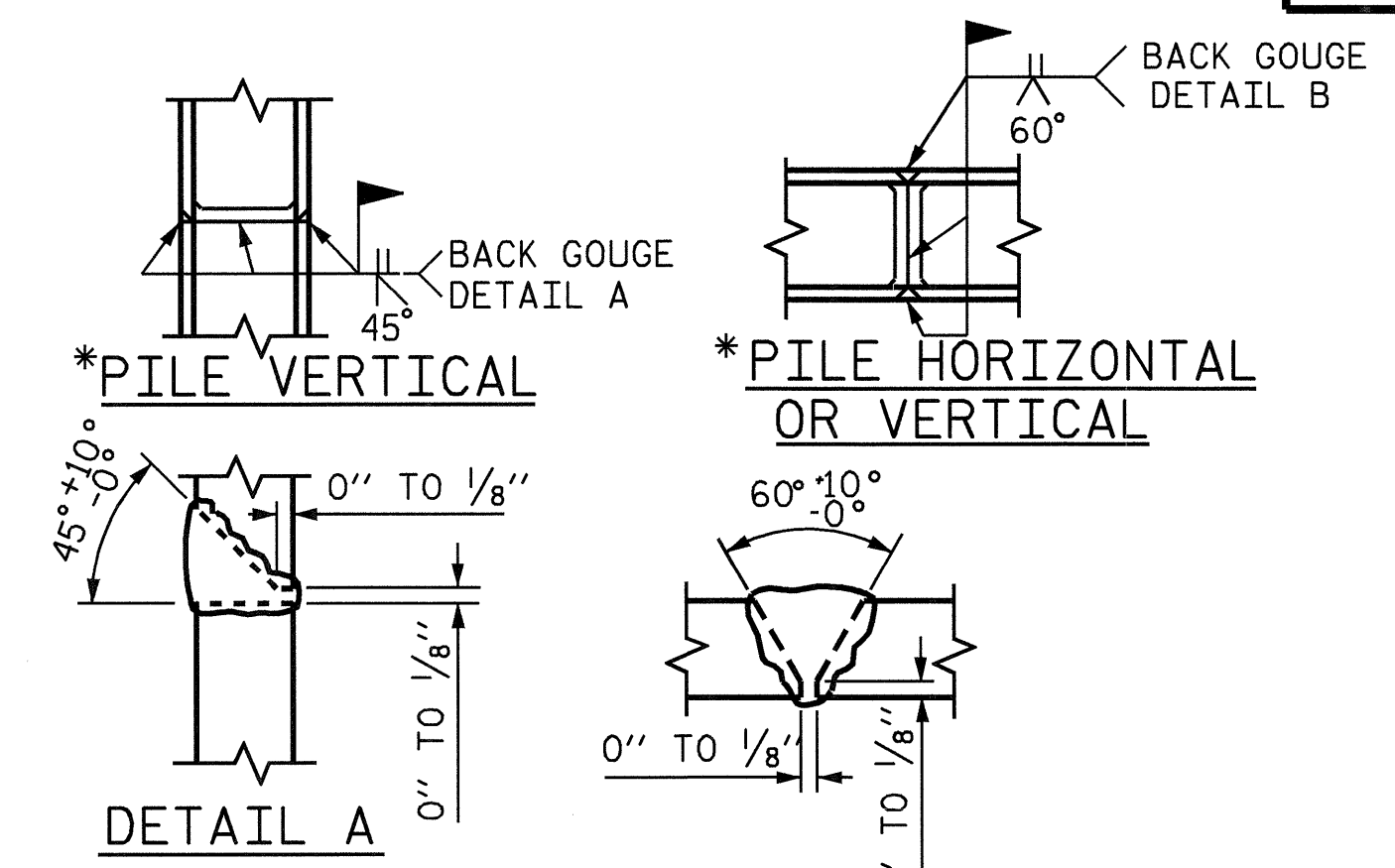
END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	9		43'-8"	594
B2	4	5	STR	41'-3"	172
B3	4	9	2	28'-11"	393
B4	4	4	STR	7'-6"	20
B5	14	4	STR	2'-5"	23
B6	8	4	STR	21'-10"	117
B7	2	5	STR	16'-8"	35
B8	4	9	2	23'-7"	321
B9	4	4	STR	14'-8"	39
B10	4	4	STR	2'-7"	7
H1	18	5	3	11'-0"	207
H2	16	5	3	9'-0"	150
K1	16	4	STR	21'-10"	233
K2	4	4	STR	3'-2"	8
K3	4	4	STR	2'-2"	6
S1	17	4	5	7'-5"	84
S2	20	4	5	8'-8"	116
S3	37	4	4	3'-2"	78
S4	16	4	7	6'-6"	69
U1	36	4	6	3'-8"	88
U2	18	4	6	5'-5"	65
V1	72	5	STR	5'-0"	375
V2	30	5	STR	8'-0"	250
V3	24	5	STR	6'-8"	167
REINFORCING STEEL (LBS.)					3617

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP & LOWER WINGS)	14.9 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	8.0 C.Y.
TOTAL CLASS A CONCRETE	22.9 C.Y.

HP 12 x 53 STEEL PILES  
NO. = 8 160.0 LIN. FT.



\* POSITION OF PILE DURING WELDING. PILE SPLICE DETAILS

PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

SHEET 3 OF 3

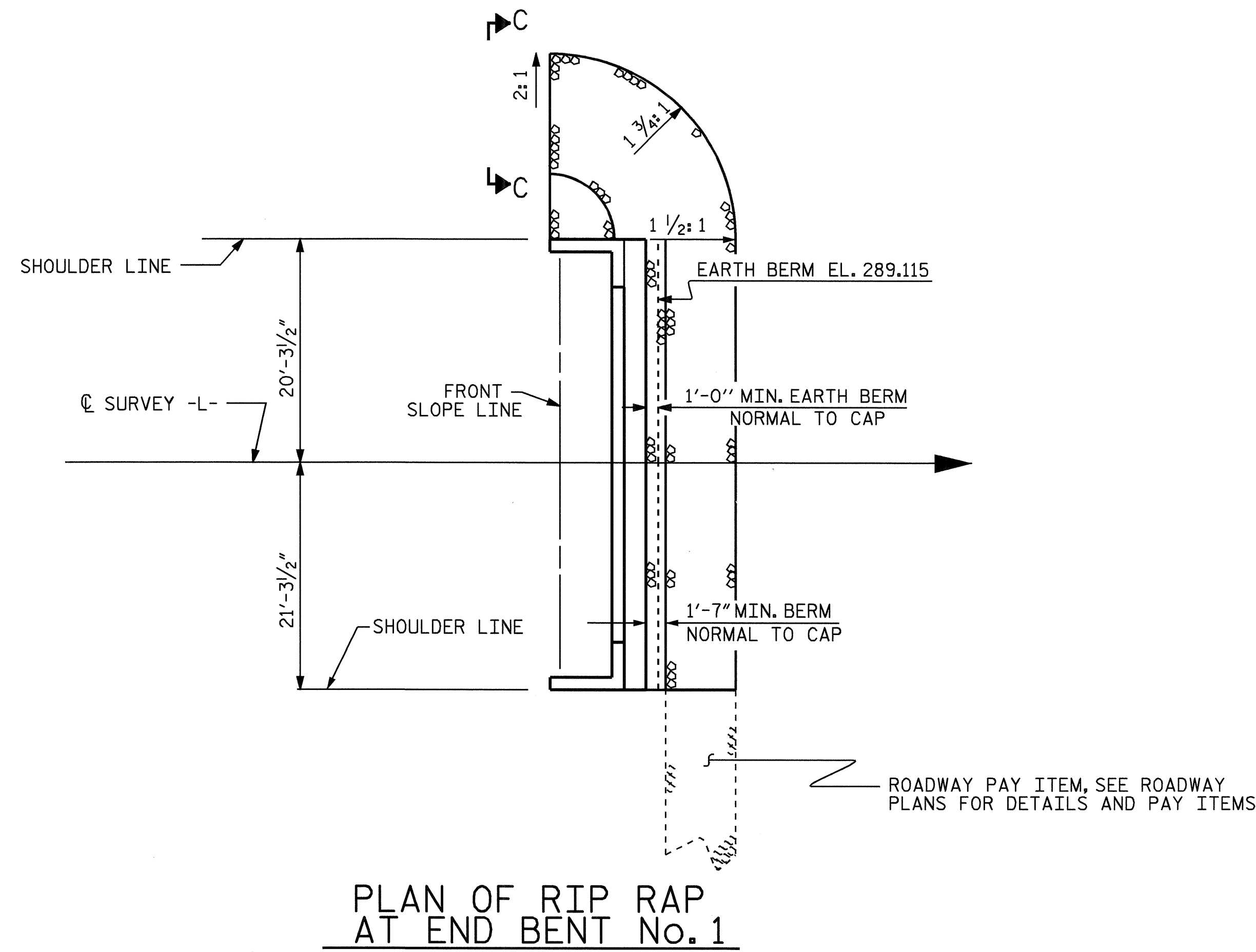
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 2

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS 36	
2			4				

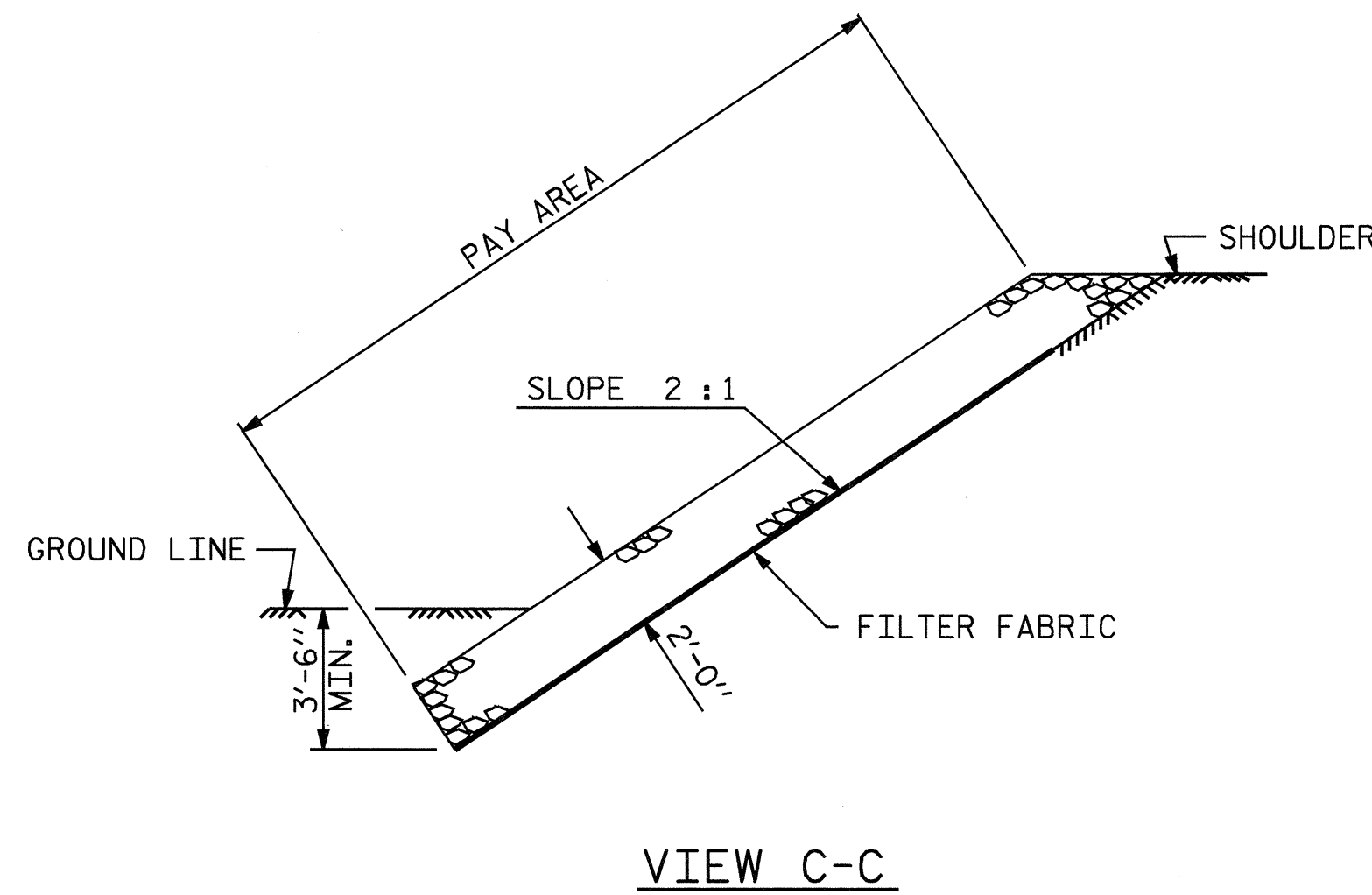
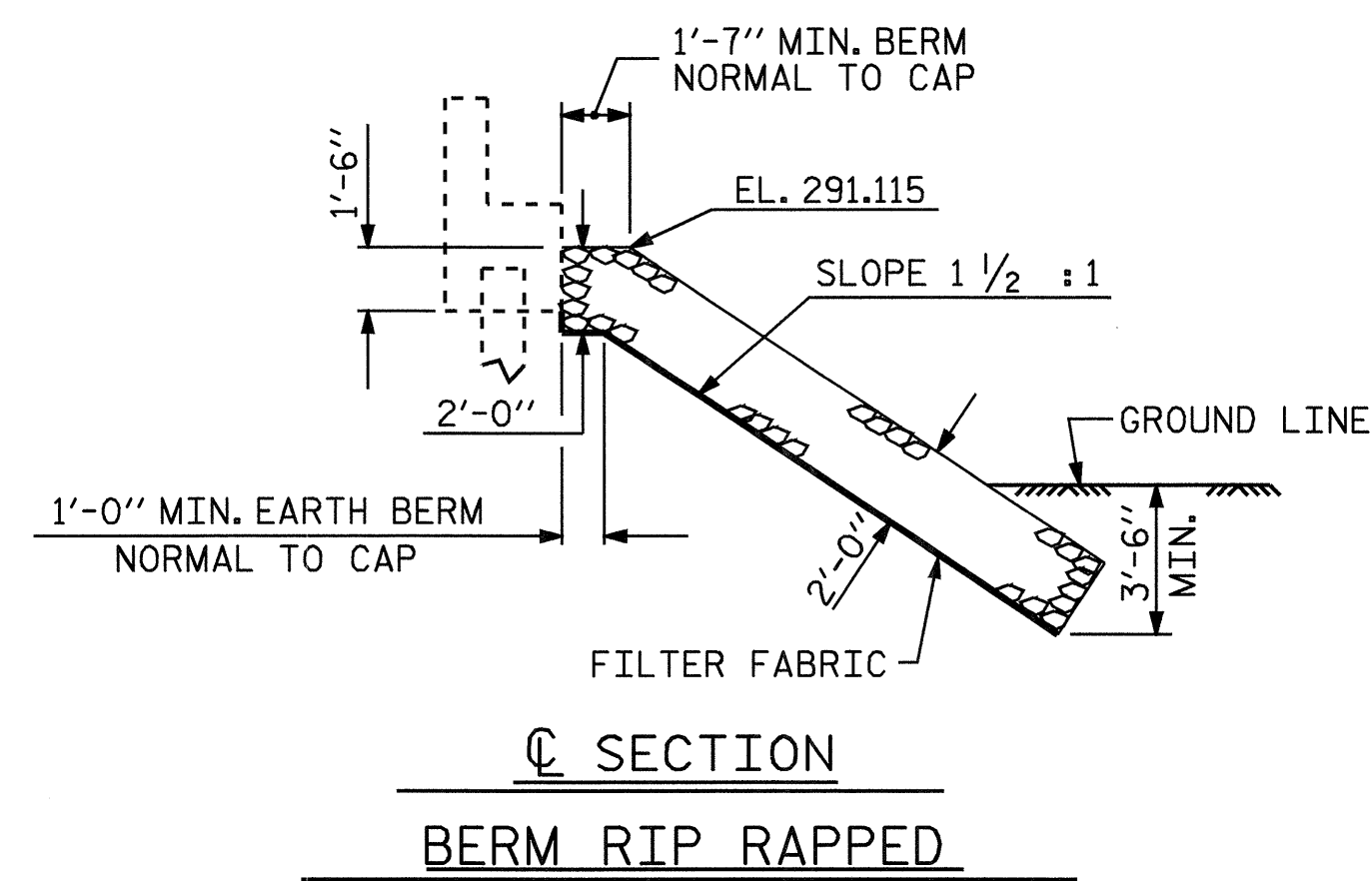


DRAWN BY : S.B. WILLIAMS DATE : 1-06  
CHECKED BY : A.K. PATEL DATE : 1-06



NOTE:  
RIP RAP AT END BENT NO. 2 INCLUDED IN  
ROADWAY DETAILS AND PAY ITEMS.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+96.50 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT NO. 1	112	124



PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

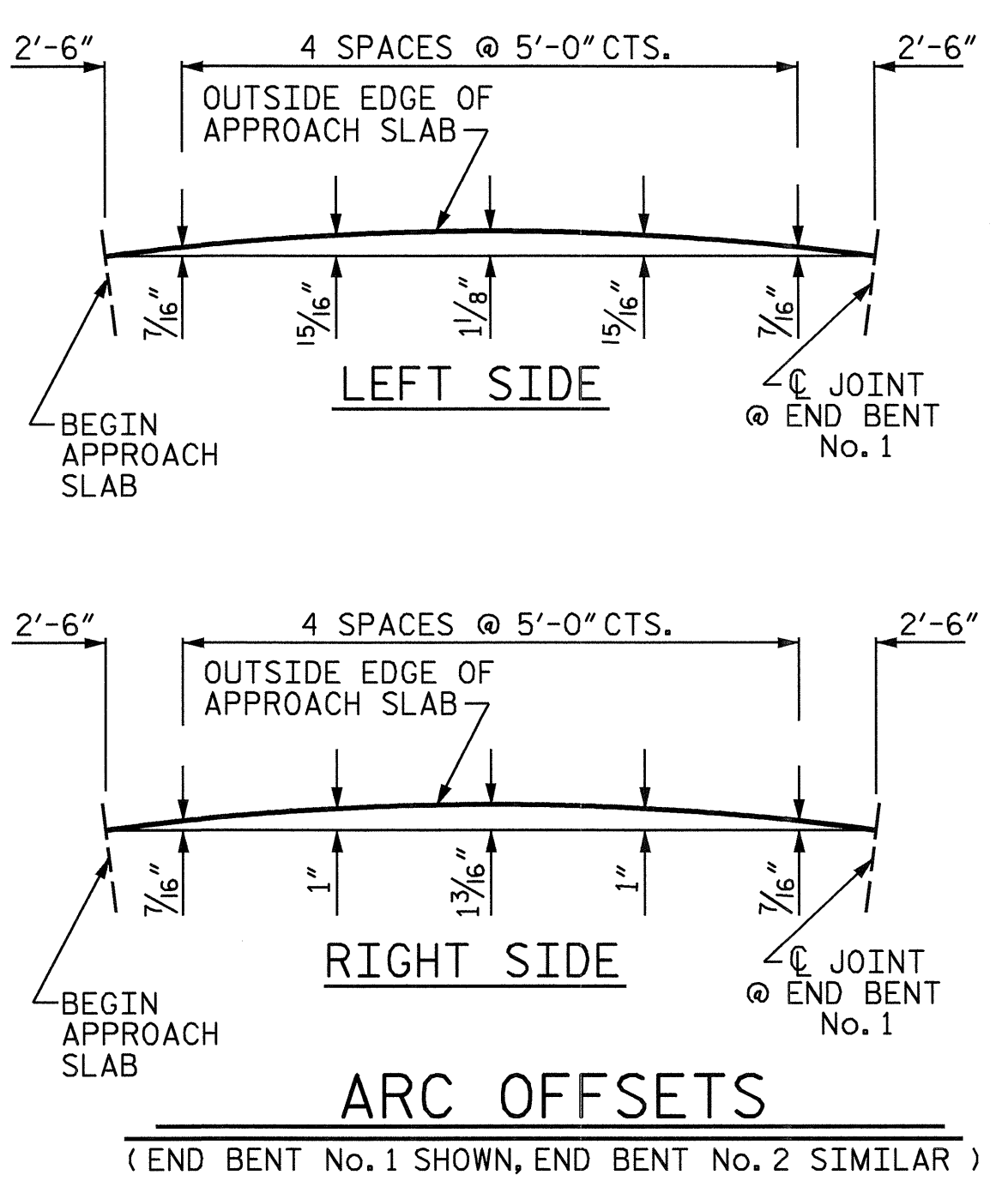
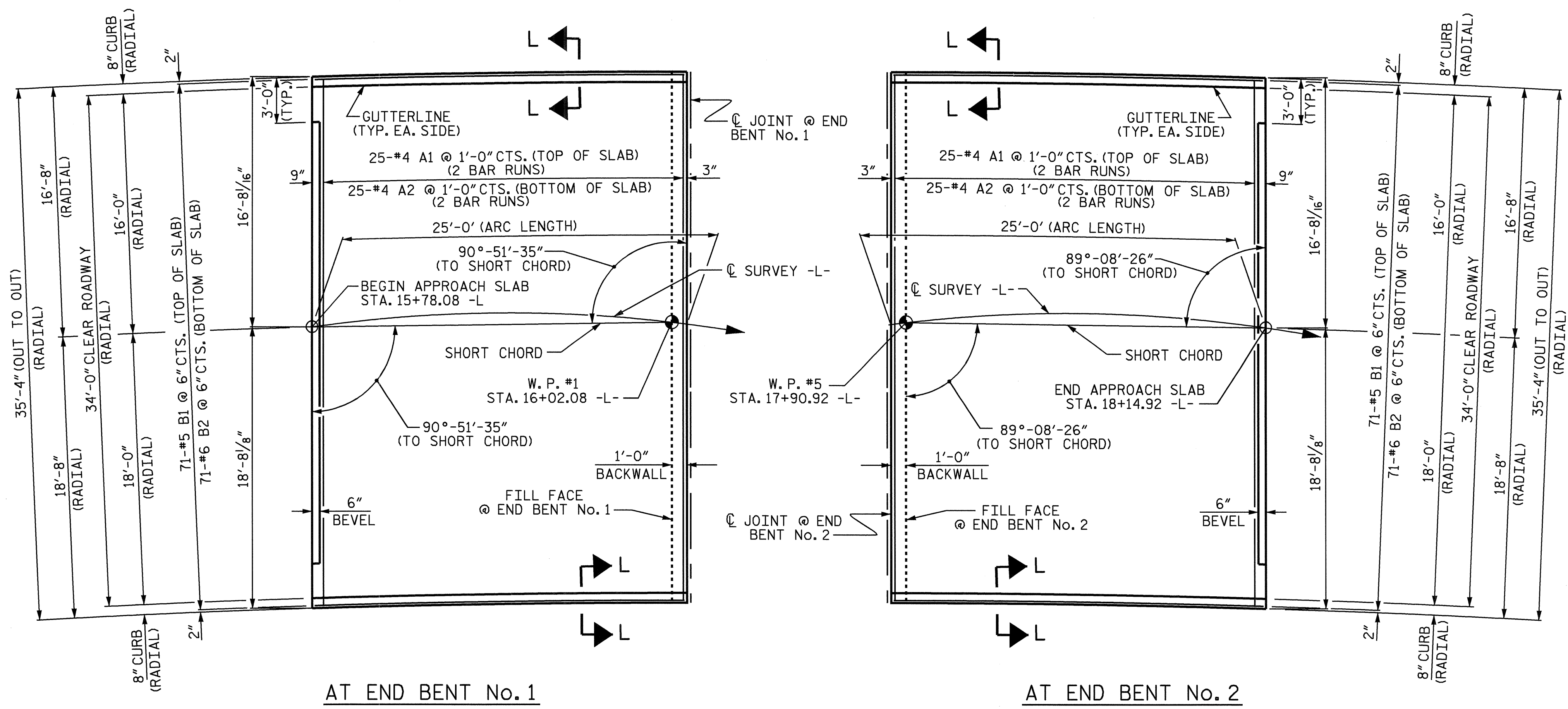


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
RIP RAP DETAILS

ASSEMBLED BY : S.B. WILLIAMS DATE : 5-06  
CHECKED BY : A.K. PATEL DATE : 5-06  
DRAWN BY : FCJ 2/88 REV. 7/17/98 REK/RWW  
CHECKED BY : ARB 8/88 REV. 8/16/99 RWW/LES  
REV. 10/17/00 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS 36
2			4			

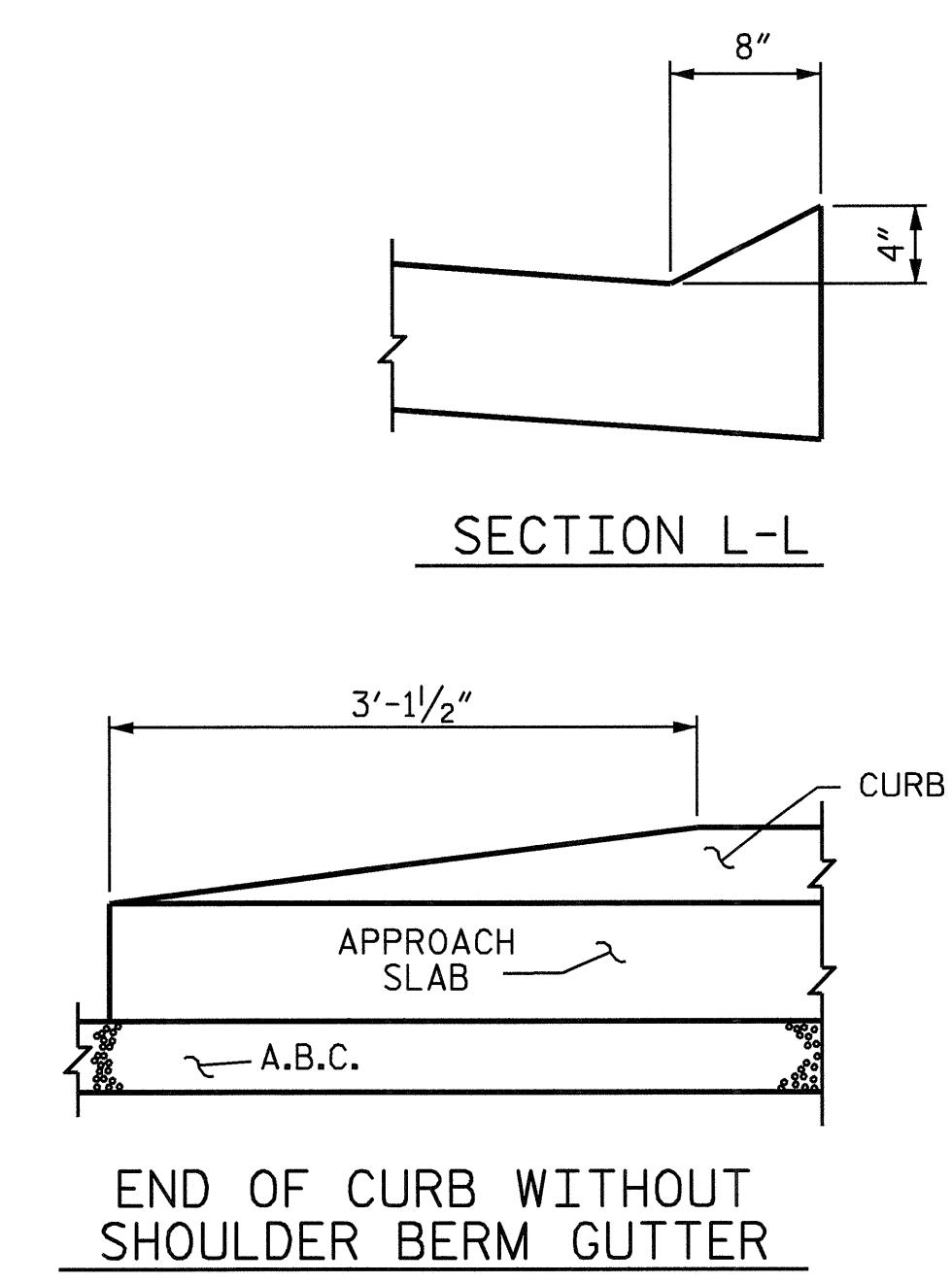
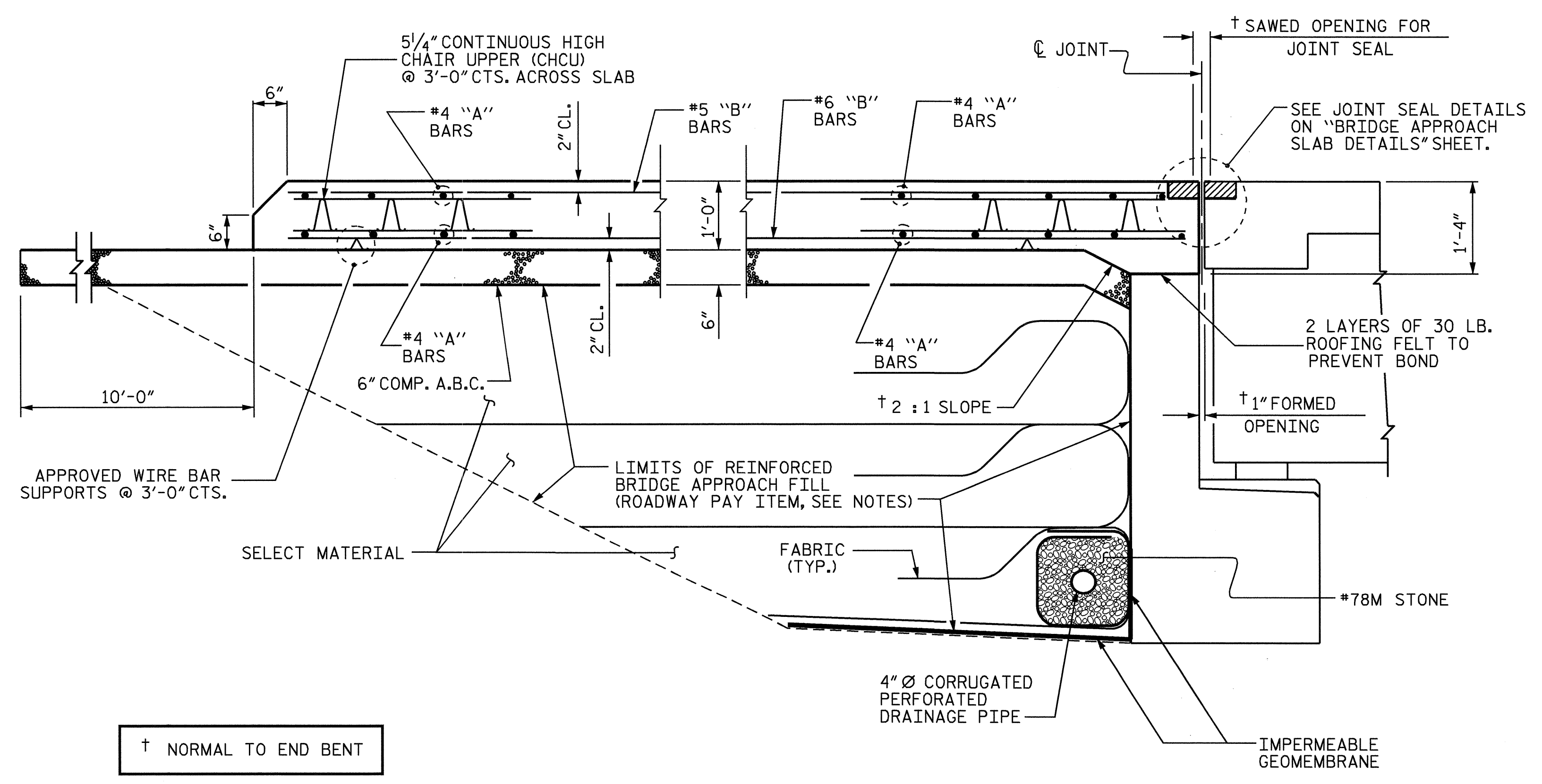
BILL OF MATERIAL					
<b>APPROACH SLAB AT EB #1</b>					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	18'-6"	618
A2	50	#4	STR	18'-5"	615
*B1	71	#5	STR	24'-2"	1790
B2	71	#6	STR	24'-8"	2631
REINFORCING STEEL					LBS. 3246
*EPOXY COATED REINFORCING STEEL					LBS. 2408
CLASS AA CONCRETE					C. Y. 33.4
<b>APPROACH SLAB AT EB #2</b>					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	18'-6"	618
A2	50	#4	STR	18'-5"	615
*B1	71	#5	STR	24'-2"	1790
B2	71	#6	STR	24'-8"	2631
REINFORCING STEEL					LBS. 3246
*EPOXY COATED REINFORCING STEEL					LBS. 2408
CLASS AA CONCRETE					C. Y. 33.4



**PLAN OF APPROACH SLABS**

**NOTES**

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE.
- THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE PARAPET AND END POST.
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



**SECTION THRU SLAB**

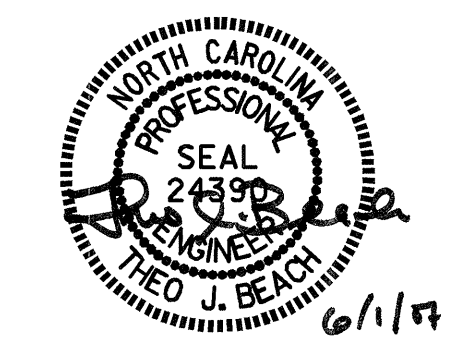
**CURB DETAILS**

PROJECT NO. B-3917  
WAKE COUNTY  
 STATION: 16+96.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

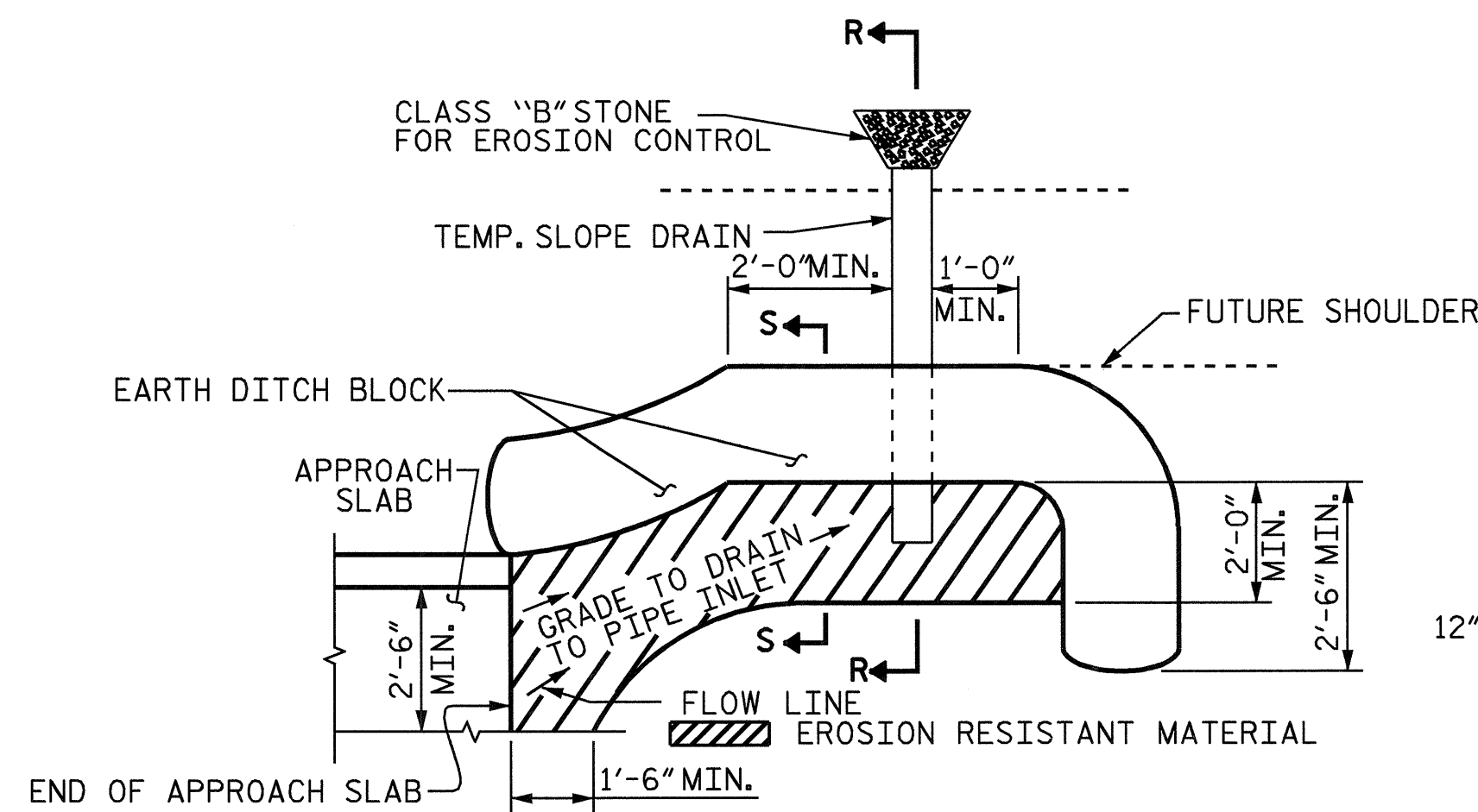
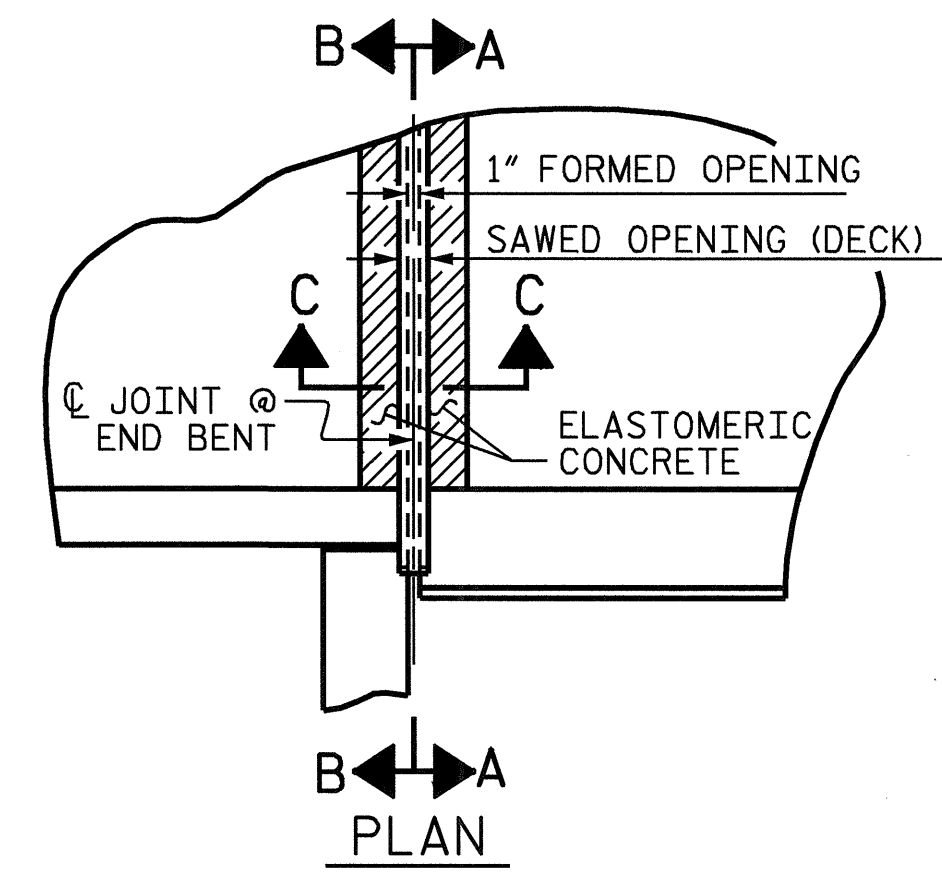
STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT



ASSEMBLED BY : S.B. WILLIAMS	DATE : 3-06
CHECKED BY : A.K. PATEL	DATE : 4-06
DRAWN BY : EEM	3/95
CHECKED BY : VAP	3/95
REV. 10/17/00	RWW/LES
REV. 7/10/01	LES/RDR
REV. 5/7/03R	RWW/JTE

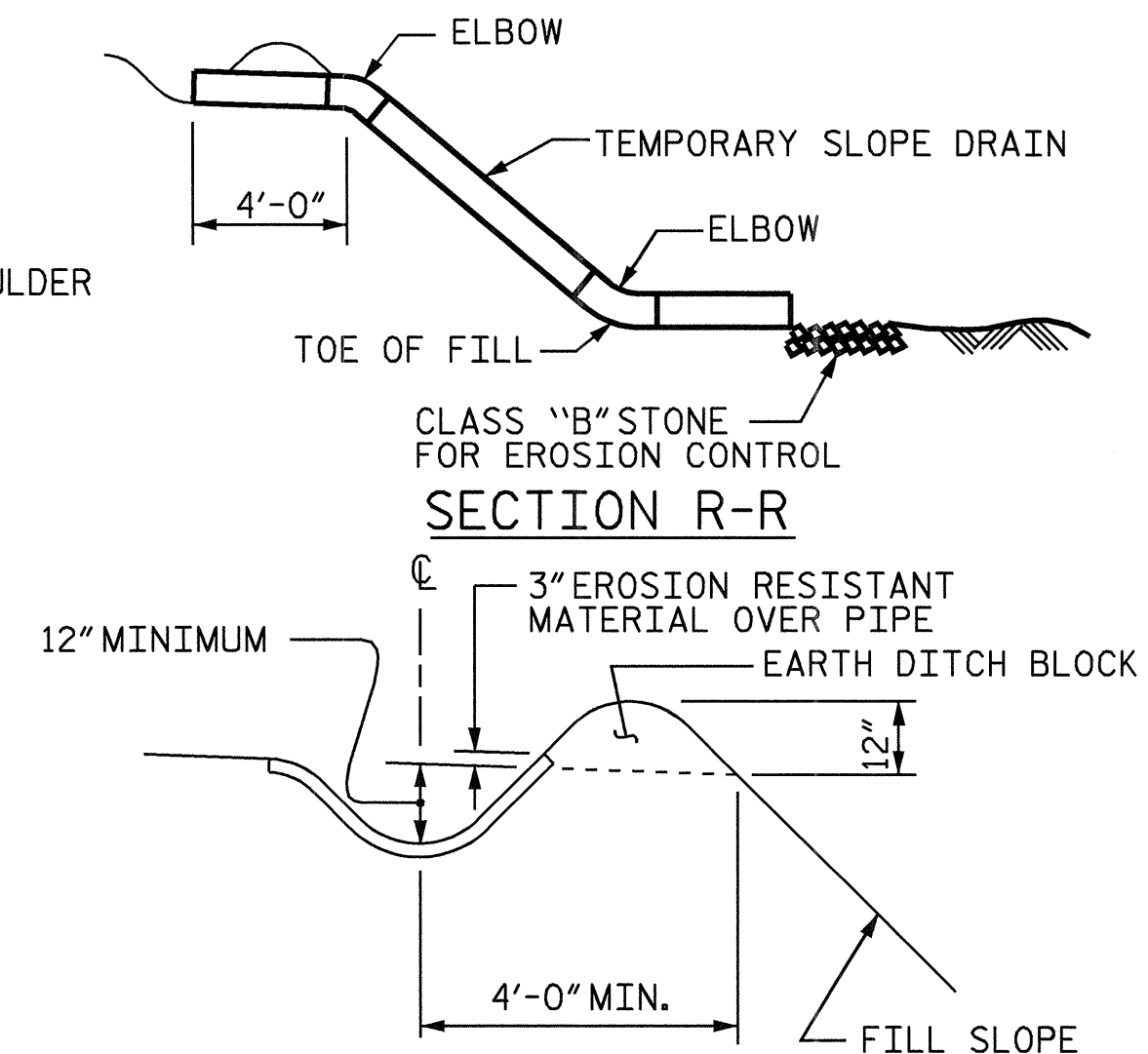
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35	
1			3			TOTAL SHEETS 36	
2			4				





NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

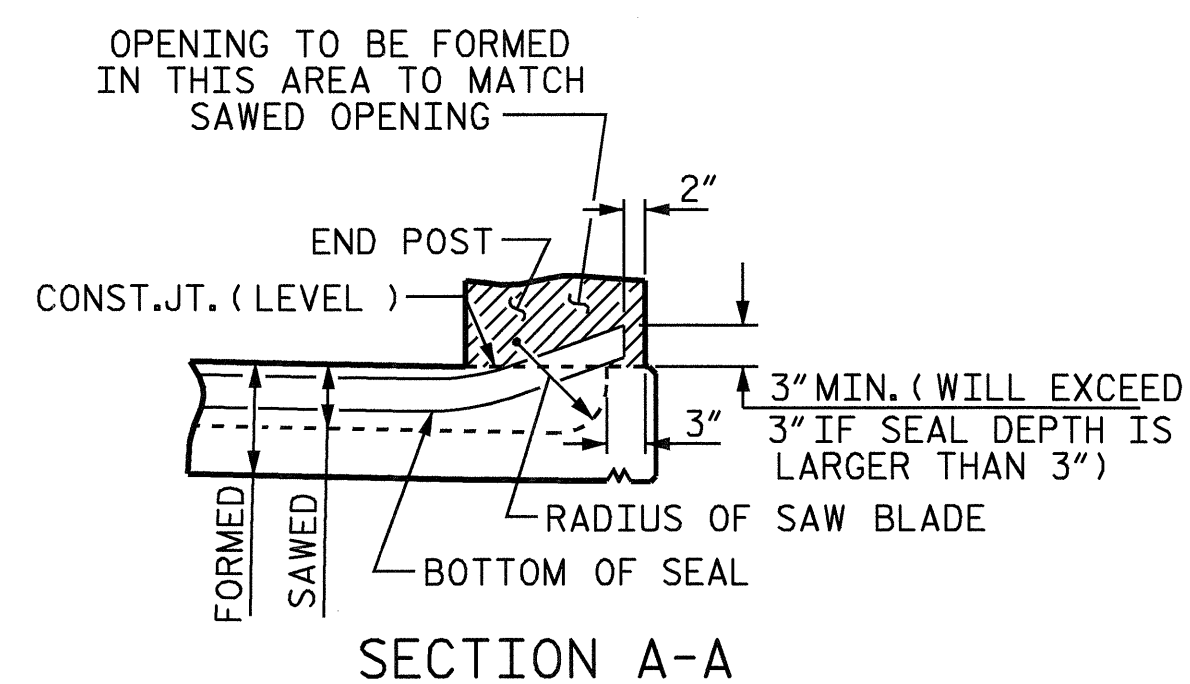
PLAN VIEW



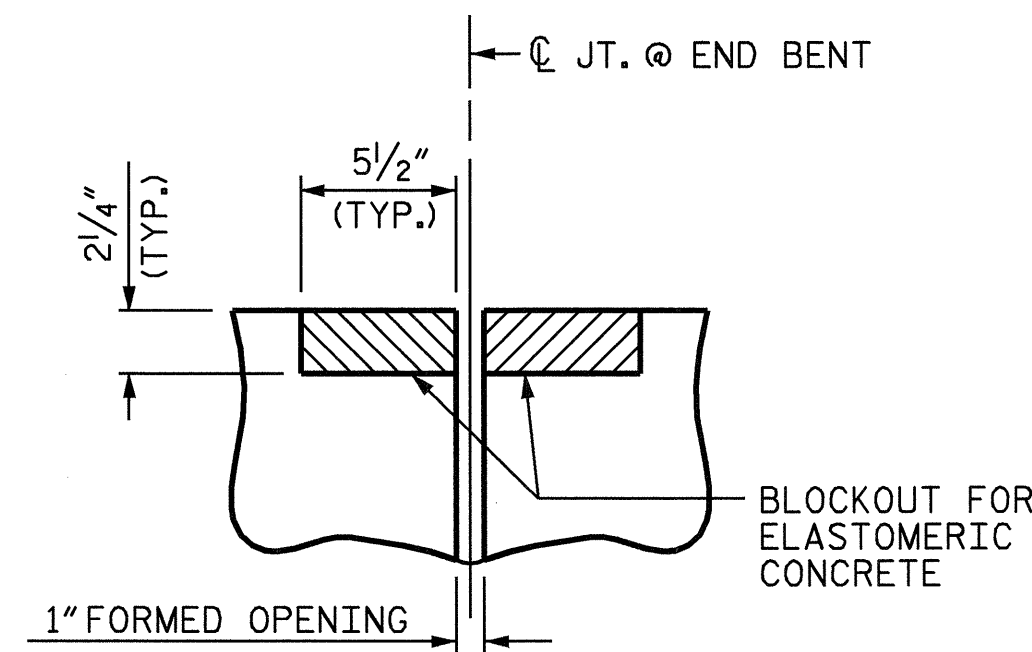
SECTION S-S

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

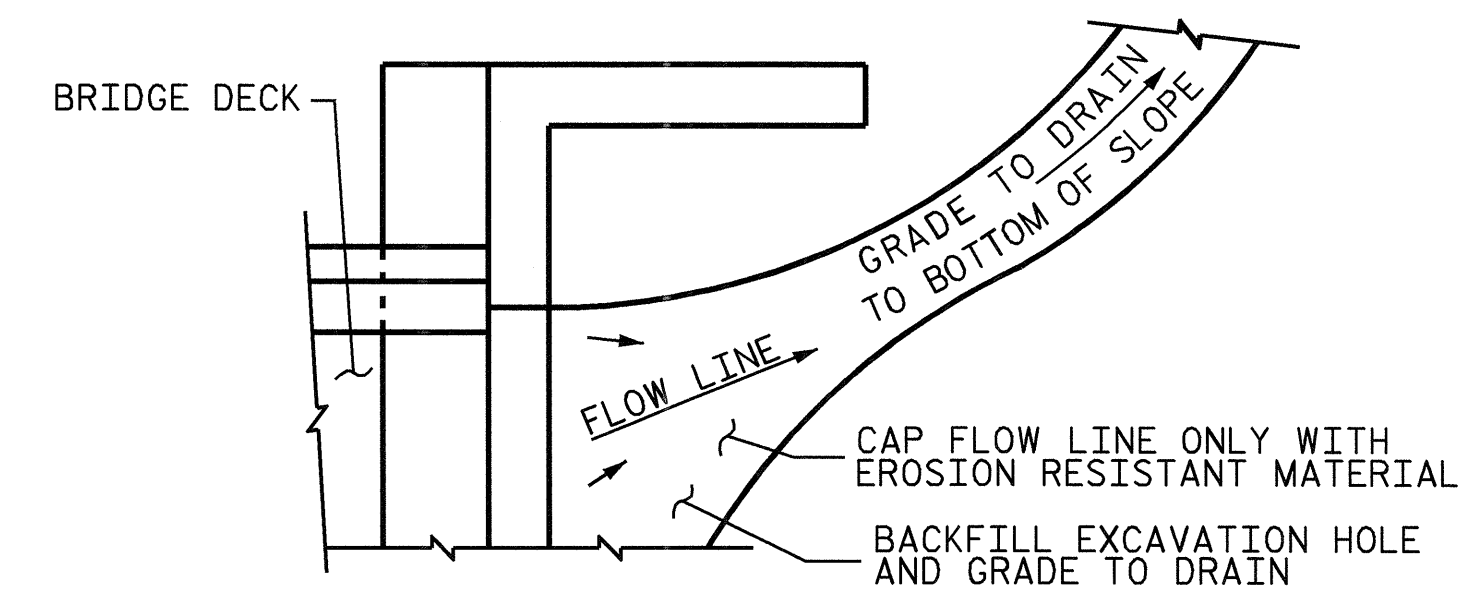
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION A-A

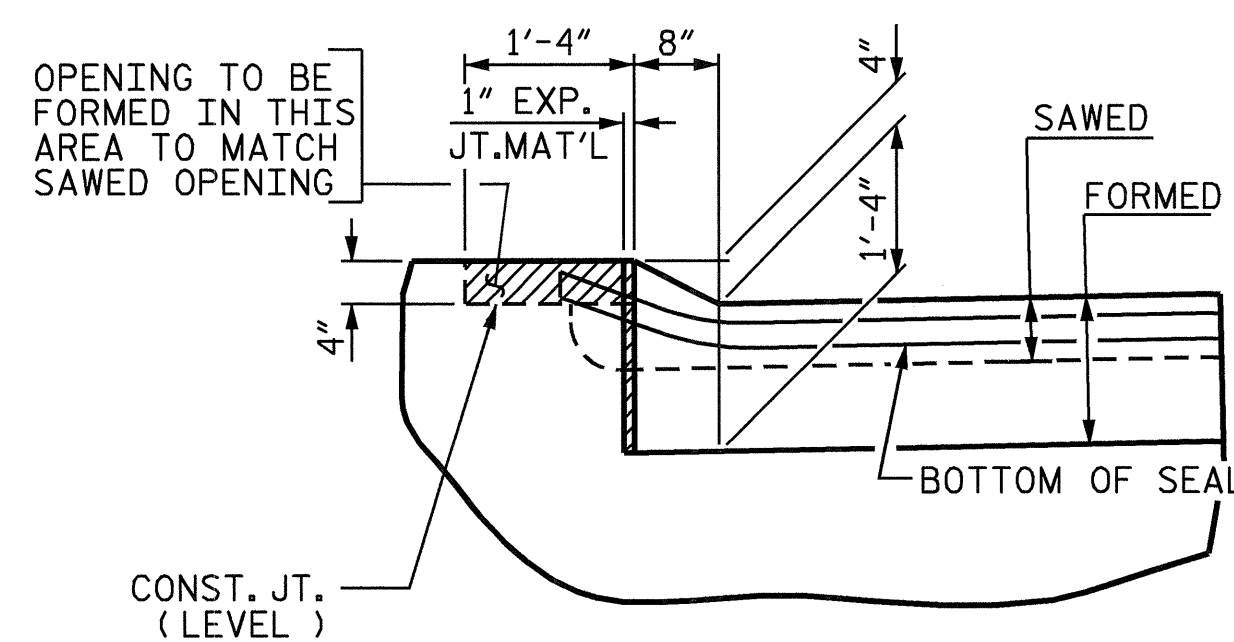


SECTION C-C  
EVAZOTE JOINT SEAL  
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

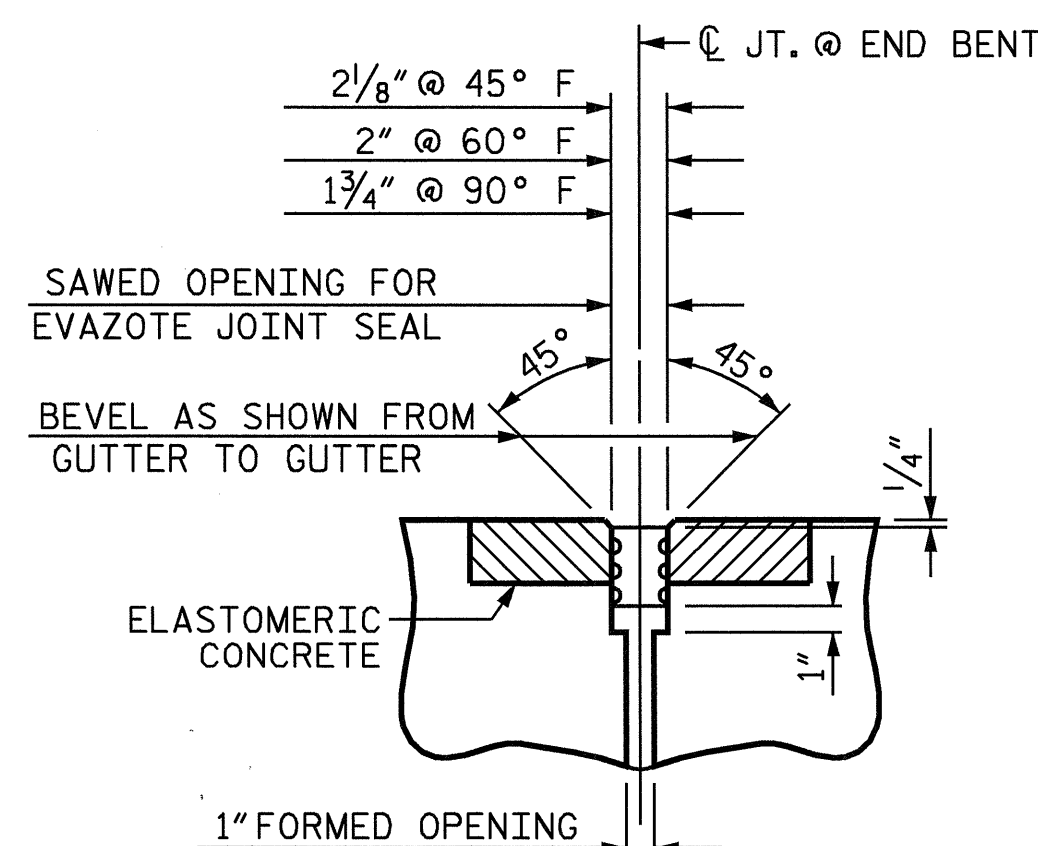


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



SECTION B-B



SECTION C-C  
EVAZOTE JOINT SEAL

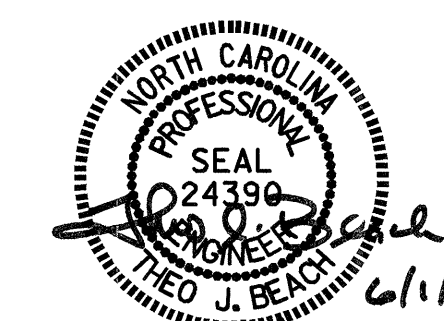
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.8
2	5.8
TOTAL	11.6

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

**JOINT SEAL DETAILS @ END BENT**

ASSEMBLED BY : S.B. WILLIAMS	DATE : 3-06
CHECKED BY : A.K. PATEL	DATE : 4-06
DRAWN BY : FCJ 11/88	REV. 8/16/99 MAB/LES
CHECKED BY : ARB 11/88	REV. 10/17/00 RWW/LES
	REV. 5/1/03 RWW/JTE

29-MAY-2007 12:40  
R:\Structures\MiscellaneousDrawings\8-3917.ed.AS.dgn  
sbwilliams



PROJECT NO. B-3917  
WAKE COUNTY  
STATION: 16+96.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD

BRIDGE APPROACH  
SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS 36
2			4			

STD. NO. BAS10

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN		
OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT.
		(MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
 ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.  
 IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.  
 DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.  
 WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".  
 EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.  
 PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.  
 WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.  
 METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN